PROJECT
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SLAMM MODEL CALIBRATION AND EXAMPLE APPLICATION PROJECT

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PREPARED FOR:

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

MADISON, WISCONSIN

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INTRODUCTION

1.1 PURPOSE

The Stormwater Loading and Management Model (SLAMM) was developed to provide a means for predicting urban watershed runoff and non-point source pollutant loadings and to evaluate various stormwater quality management options. The purpose of this project was to re-calibrate portions of the SLAMM model using existing and newly-collected data and to provide example applications of the model to watersheds typical of those requiring stormwater management decisions. This effort was part of a larger overall stormwater quality management assessment of both groundwater pollution associated with the infiltration of urban stormwater and the source identification of pollutants in urban runoff conducted by the Wisconsin Department of Natural Resources (WDNR).

1.2 SCOPE OF WORK

The scope of work for this project was essentially as described in the Warzyn proposal to DNR dated April 10, 1991. The project activities were divided into three general phases: sub-basin data review and verification, SLAMM model calibration, and use of the calibrated model in example applications to Milwaukee area sub-basins. Work was conducted over the period of June through December, 1991 at Warzyn's Madison, Wisconsin Office. The scope of work included frequent meetings, discussion and data exchanges with WDNR personnel, and, to a lesser extent, with personnel of the U.S. Geological Survey Water Resource Division (USGS), Madison, Wisconsin office.

The original scope of work called for calibration of the SLAMM model for runoff, total suspended solids, and copper and zinc loading rates. However, WDNR later requested that the zinc loading rate be deleted from the analysis due to various problems with the available analytical data. In addition, the original scope of work called for preparation of separate memoranda on each of the three main phases of project activity. The Phase I memorandum was issued on November 13, 1991. As agreed to by WDNR, this final report includes the content of the Phase I Memorandum, and provides a full reporting of the three phases of project activity.

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THE STORMWATER LOADING AND MANAGEMENT MODEL

2.1 GENERAL DESCRIPTION

The SLAMM model was developed by Robert Pitt, formerly of the WDNR and currently an Assistant Professor in the Department of Civil Engineering at the University of Alabama in Birmingham. The model was developed to aid in the analysis of the effects of land use and stormwater management on urban runoff quality and quantity. The model requires that the urban watershed be described in terms of specified land uses and source areas. It then calculates total pollutant loadings from each area, and provides maximum, minimum, and average values for those areas. This information can be used to pinpoint critical nonpoint pollution sources.

By using typical land use data, estimates of pollutant loadings can be developed if no pollution control practices are used. The analyst can then apply different control practices to different source areas. From this information, the analyst can determine control practice effects on loading and runoff quantities, and alter specific control practice designs. A control practice design may be analyzed as a retrofit in an established area or as a new practice to reduce pollutants coming from developing areas.

A summary of the Land Use Categories, Source Area Characteristics, Pollution Control Practices and Stormwater Quality Parameters applied in the SLAMM model is presented below:

1. Land Uses:
   - Residential
   - Commercial
   - Open Spaces
   - Institutional
   - Industrial
   - Freeways

2. Source Areas:
   - Roofs
   - Paved Parking/Storage
   - Unpaved Parking/Storage
   - Playgrounds
   - Driveways
   - Undeveloped Areas
   - Small Landscaped Areas
   - Other Pervious Areas
   - Other Areas
   - Freeway Lanes/Shoulders

- Sidewalks/Walks
- Streets/Alleys
- Large Turf Areas
- Large Landscaped Areas

3. Pollution Control Practices:

- Detention Ponds
- Infiltration Devices
- Catchbasin Cleaning
- Roof Disconnections
- Porous Pavement
- Street Cleaning
- Grass Swales
- Paved Area Disconnections

4. Stormwater Quality Parameters:

- Storm Runoff Volume
- Total Suspended Solids loading
- Dissolved and particle. adsorbed loading of contaminants such as Cu, Zn, BOD, or phosphorus

SLAMM allows the model user to apply runoff and pollutant data from urban non-point studies to determine loadings. To predict runoff, the model uses a series of storm rainfall/runoff coefficients specific to source area types. The model uses a series of particulate solids coefficients to predict solids loadings based upon land use, source area type, and rainfall depth. SLAMM then determines dissolved and adsorbed pollutant loadings from the total runoff runoff volume, total solids loading, and from pollutant concentrations which depend on land use and source area. Pollution control practices are modeled using algorithms which describe how a control practice functions. These algorithms reduce the suspended solids and pollutant loading predictions, based upon the specified control practice. SLAMM model documentation is maintained by WDNR (WDNR, 1989a, b) and by Robert Pitt (Pitt, 1989).

2.2 MODIFICATIONS TO THE SLAMM MODEL

Earlier efforts by WDNR to calibrate the SLAMM Model were only partly successful. Part of this difficulty was due to errors in several sub-basin input data files. However, an additional source of the earlier calibration difficulty, discovered during this project, consisted of a problem in the SLAMM Model data input routines. One subroutine in the data input portion of the model was designed to adjust street pollutant loading coefficients if the street characteristics were changed. However, portions of this subroutine did not operate as originally designed, and street loading coefficients were not changed automatically with changes in street description data input. This error was detected and corrected soon after project work began. The SLAMM model included with this project report includes this street loading coefficients input routine correction.

2.3 SLAMM MODEL UTILIZATION

The executable code for the the corrected (See Section 2.2) SLAMM Model (designated version 5.3) is included in the diskette contained in Appendix E. Also included in Appendix E are the calibrated pollutant coefficient files as well as study area data files for all study area sub-basins used in this analysis.

The SLAMM Model is designed for use under MSDOS operating systems. A math coprocessor is recommended for prompt model operation.

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Model Input And Calibration Data Review And Verification

3.1 CALIBRATION SUB-BASIN DESCRIPTION

A total of ten urban study area data sets from southern Wisconsin were used to calibrate the SLAMM model. Six of the study area sub-basins were located in the Milwaukee urban area, and were investigated and sampled as part of EPA's National Urban Runoff Program (NURP) urban stormwater study during the years 1980 - 1982. Two of the Milwaukee NURP sub-basins were resampled by WDNR and the USGS in 1990 to create additional study area data sets. In addition, WDNR and the USGS conducted sampling programs for two sub-basins in Madison, Wisconsin during 1991. The general characteristics of the sub-basins and data used in calibration is summarized in Table 1. The drawings in Appendix D, supplied by USGS, illustrate the layout of each study area.

The sub-basin areas range in size from approximately 12 to 250 acres, and include residential, commercial and industrial areas. Most of the sub-basins included some type of street sweeping and/or regular catch basin maintenance, but included no other stormwater management practices or facilities.

Data collection for the 1980-1982 Milwaukee NURP study areas is documented in the general NURP Project Report (U.S. EPA, 1983). The NURP sub-basin data supplied for this project by WDNR included runoff, suspended solids and metals data from 40 to 80 storm events. The NURP data was collected at a single sub-basin outlet point, so the data represents a combination of the responses from the various land uses and source areas within the study area. The 1990 restudies of two of the NURP area sub-basins, the Hastings and Wood Center study areas, provided data for an additional 13 and 19 storm events, respectively. The WDNR 1991 sampling of the Monroe Street and Syene Road study areas in the Madison, Wisconsin area included both whole sub-basin and some source area water quality sampling. The study area instrumentation and data collection program conducted by WDNR during 1990 and 1991 is being reported separately as part of the overall WDNR-sponsored project.

3.2 DEVELOPMENT AND VERIFICATION OF STUDY AREA DATA

The first phase of the project was an evaluation of the format and completeness of the data used to calibrate SLAMM. The evaluation included a review of the data for consistency and applicability to the model calibration process, Milwaukee and Madison site visits, and modifications to the model input data files to accurately reflect site conditions. The calibration data file creation/correction process was done in two concurrent steps. One step included site visits to Milwaukee to more accurately characterize certain sections of those sub-basins. The second step was to re-measure source areas at each Site from blueprints of original aerial photographs. New site files were created from the areal and site characterization data developed from these two steps.

The Milwaukee-area site visits were performed by Warzyn and WDNR personnel to characterize site drainage connections for rooftops and driveways. The four sites which contained residential land uses were inspected to evaluate the percentage of rooftops and (for the Hastings and Burbank sites only), driveways which were disconnected from the storm drainage system. A fraction of a driveway or a rooftop was defined as disconnected if it drained to a pervious area. The results of the survey are included in Table 2, and were used to modify the site data input files. Because of the difficulty in evaluating the fraction of disconnected sidewalks, it was assumed that 50% of the sidewalks drained to pervious areas. Area calculations for source areas from each Milwaukee area site were obtained from digitized 1"=100' aerial photos by USGS personnel.

Surveys of the Syene Road site were also performed by Warzyn and WDNR personnel. These surveys included basin area delineation and site drainage connection characterizations. Monroe Street site surveys were performed by WDNR personnel. USGS personnel digitized the source areas for both sites.

The SLAMM site description input data files were developed using source area and impervious area connection data, supplemented with other site characterization information. This information include soil type, street characteristics, industrial and commercial rooftop drainage system connections, and catchbasin and delivery system characteristics. Site description data files for the Madison and Milwaukee area sites were initially developed by WDNR and USGS staff, and were then reviewed and modified where necessary and appropriate by Warzyn and WDNR.

Calibration sub-basin input data files used for SLAMM model calibration for each of the eight calibration study areas is described in the model input files listed in Appendix A.

3.3 RAINFALL DATA

Rainfall data sets for use with the source area description files in the SLAMM model were supplied by WDNR. The data consisted of separate storm duration/rainfall depth files for each of the calibration study areas. The storm rainfall depths were obtained from rainfall gages located within each sub-basin. The storm rainfall data files were reviewed for format and consistency, but were not checked against external data sources as part of this project. Rainfall data collection procedures for the NURP study are described in the overall project report (WDNR, 1983). Rainfall data collection procedures for the 1990 Milwaukee and 1991 Madison area WDNR projects are available from WDNR, and are in the process of being documented. The rainfall data files used in this study are included on the diskette in Appendix D.

3.4 SUB-BASIN RUNOFF, SUSPENDED SOLIDS AND COPPER LOADING DATA

Collected data from the calibration sub-basin sites was provided to Warzyn by WDNR. The Milwaukee NURP (1980-1982) data on runoff volume and suspended solids was taken from EPA project report data summaries. This data consisted of sub-basin outfall samples only. The 1990 restudy data for the Burbank and Wood Center NURP sites also described whole sub-basin runoff and suspended solids data. These 1980-1982 and 1990 data sets represented whole-storm runoff volume and flow-composite suspended solids data. The procedures for data collection and analysis for the 1980-1982 NURP studies is available (WDNR, 1983), and the procedures for the 1990 re-study is available from WDNR.

Data for the 1991 study of the Monroe Street and Syene Road sites was provided by WDNR and USGS. The 1991 study collected both sub-basin outlet and source area data. Sub-basin outlet data was collected on a flow-proportional basis. Source area data was collected by using several techniques. Documentation of these data collection and analytical procedures is being prepared by WDNR.

The collected whole sub-basin runoff volume, suspended solids and copper loading data for each watershed are included in the detailed calibration spreadsheet listings presented in Appendix B.

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SLAMM MODEL CALIBRATION

4.1 CALIBRATION PROCEDURE

4.1.1 General Approach

All available data from the 1980-1982 NURP study, from the WDNR-USGS studies of 1990 (for Hastings and Wood Center) in Milwaukee, and the 1991 data for Monroe Street and Syene Road were used in the SLAMM calibration process. Due to the relatively small size of the data sets, they were not divided to permit a verification analysis.

The general approach to calibration was to start with data sets dominated by one source area and land use. Runoff volume was the first parameter to be calibrated, and was followed by suspended solids and, finally, copper. The objective of the calibration process was to reproduce the total (multi-storm) loading as closely as possible, rather than model the range of loadings associated with the largest or smallest storms in the data set. Summary data describing the accuracy of model calibrations for runoff and suspended solids is contained in Table 3, and for copper loading, in Table 4.

The calibration data sets did not include every possible combination of land use and source area. For this reason, only a portion of the runoff, suspended solids and copper loading portions of the SLAMM model were calibrated. The source areas and land use categories which were calibrated are specified in Tables 5, 6 and 7 for runoff, suspended solids and copper loading, respectively.

More detailed descriptions of the calibration procedures are presented in Sections 4.1.2 through 4.1.4, and detailed descriptions of calibration results for each calibration study area presented in Section 4.2.

4.1.2 Runoff Calibration

To predict runoff, SLAMM assumes that runoff is an incrementally linear function of rain depth, for various runoff source areas. Runoff depth is calculated as a specified fraction of rainfall, with the fraction varying by rainfall depth. A total of seventeen rainfall-runoff fractions are used in the model over the rainfall range 0.0 in. to 4.7+ in. The calibration file to predict runoff was developed by determining from the data, for the nine specific source areas and three drainage area modifiers listed in Table 5, what fraction of rainfall becomes runoff for a given rainfall depth. These fractions, or runoff coefficients, were entered in the runoff coefficient file. The model was then run with the runoff coefficient file, and the resulting model output compared with the observed data. If the residual runoff totals (observed value less predicted value) were large, modifications were made to the runoff coefficient file, the model was re-run and the results reviewed again. This process continued until the results could not be improved upon, or until no additional changes could be made to runoff coefficients without altering previously established coefficients. The final set of event-by-event comparisons for each site can be found in Appendix B. The final runoff coefficient file, MILW00.RSV, is listed in Appendix A and is included on the diskette in Appendix E.

4.1.3 Suspended Solids Calibration

The process used in calibrating suspended solids was similar to the process used for runoff depth. As with runoff, SLAMM assumes that suspended solids concentrations are an incremental linear function of rain depth, source area, and, for suspended solids, land use. The initial calibration file used to predict suspended solids loadings was developed from collected data by determining, for the specified source areas and land uses listed in Table 6, the average suspended solids concentration for a source area in a land use, by rainfall depth. These particulate solids concentrations were entered in the particulate solids concentration file. The model was then run and the resulting output compared with the observed data. The primary calibration criteria was to reproduce the suspended solids loading for the entire data record, as described above. If the residual loading totals were large, then additional modifications were made to the particulate runoff concentration file, the model re-run and the results reviewed. The closure criteria was similar to that for runoff. This process continued until the results could not be substantially improved or until no additional changes could be made to particulate solids concentration values without altering previously established values. The final set of event-by-event comparisons for each site can be found in Appendix B. The final particulate solids concentrations file, MILW00.PSC, is listed in Appendix A and is included on the diskette in Appendix E.

The delivery parameter file is used to predict the reduction in suspended solids loading between the source areas and the outfall which occurs primarily during smaller rainfall events. The model assumes that the efficiency with which the drainage system delivers suspended solids to the outfall is a function of rain depth and the overall delivery system slope and roughness. The final delivery particulate reduction file, MILW00.PRR, was developed to allow the model to reproduce as closely as possible the total suspended solids loading from the study areas. The original pre-calibration delivery file, DELIVERY.PRR, is also included on the disk in Appendix E for informational purposes. Use of the parameters in the original file DELIVERY.PRR results in slight under-prediction of total suspended solids loading, compared to MILW00.PRR. The final particulate delivery reduction file, MILW00.PRR is listed in Appendix A and is included on the diskette in Appendix E.

4.1.4 Copper Loading Calibration

To predict loading from other contaminants (such as copper), SLAMM assumes that these contaminants are released in two phases: a particulate-adsorbed phase, and a dissolved phase. The particulate-adsorbed phase loading is calculated as a specified fraction of the total suspended solids loading, and the dissolved phase as a concentration value. The calibration file to predict these loadings is developed by determining, for the specified source areas and land uses listed in Table 7, the average concentration values by source area for both the particulate and the dissolved (or filterable) form of the pollutant. Copper data was available for only the Monroe Street and Syene Road sites for only a few storm events (see Table 1). For dissolved copper, the geometric mean of individual storm source area dissolved copper values was entered into the pollutant value parameter file for each available source area. For particulate copper, the geometric mean of the ratio of particulate copper to suspended solids for all storms was entered into the pollutant value parameter file for each available source area. After the initial model run, modifications were made only to parameters developed from the Monroe Street data.

4.2 Calibration Results

4.2.1 Summary of Results

Overall, the SLAMM model was calibrated to accurately reproduce the collected data on a total loading basis. Figures 1, 2 and 3 illustrate the accuracy of observed vs. modeled results for runoff volume, suspended solids loading, and total copper loading.

The total predicted runoff from the six Milwaukee 1980-1982 NURP sites and the Monroe Street site were within 15 percent of the observed total runoff and usually less than 10 percent. The model underpredicted the Syene Road industrial site total runoff by 28%.

The predicted total suspended solids loading from the six Milwaukee sites was, except for the Rustler commercial study area, within 20% of the observed values before outliers were removed. After selected outliers were removed, the predicted value for all six study areas except for the Burbank residential site was within 10% of the observed value. The predicted total suspended solids loading for the two Madison study areas were within 10% of the observed values. The following discussion summarizes the calibration results for each site.

The predicted total copper loading was, for the residential Monroe Street study area, within 1% of the observed total copper loading. The model predicted the total copper loading for the commercial Syene Road study area to within 11% of the observed loading.

4.2.2 Summary Table Presentation Format

The results of the SLAMM model calibration for each site are summarized in Tables 3 and 4. Table 3 first lists the number of rainfall/suspended solids events recorded at each site and the average depth and the coefficient of variation of the rainfall events for each site. The rainfall information is included to allow the reader to qualitatively compare the average rainfall depth to the average runoff depth.

The next three columns in Table 3 summarize the runoff statistics of total depth, average depth, and the coefficient of variation for each site. Both the observed and the predicted values are listed. The comparison between the observed and predicted values is illustrated by both the residual value and the percent difference between the observed and predicted value. The suspended solids loadings, which are listed in the final three columns, are described in a similar manner.

The statistics in Table 3 are presented for the site data, with and without outliers. Outliers for the 1980 to 1982 NURP data from Milwaukee were selected, by inspection, if the residual was large. Outliers for the 1990 Milwaukee data from Hastings and Wood Center, and the Monroe Street and Syene Road data, were defined by a residual value to observed value ratio greater than 4.0. By this definition, there were no residuals for the Syene Road data.

Table 4 summarizes the results of the copper calibrations for the Monroe Street and Syene Road study areas. These tables list the number of events recorded at each study area and compares the observed and predicted results for total copper, dissolved copper, and particulate copper at each study area.

4.2.3 Post Office Study Area

The post office data set is the largest of the data sets. The average runoff depth was 91% of the average rainfall depth. The percent difference between the observed and predicted runoff total depth and the runoff average depth was 2% for both the entire Post Office data set and the data set less one outlier, indicating that the outlier did not affect model runoff prediction. The coefficient of variation for both sets of runoff data were virtually identical.

The percent difference between the observed and predicted suspended solids total values and the average suspended solids values was 11%. This was reduced to 0% after the one outlier was removed because predicted suspended solids for paved areas (the only Post Office source area) were calibrated to exactly match the observed values once the outlier was removed from the data set. The coefficients of variation for the suspended solids data sets after the outlier was removed were virtually identical.

4.2.4 Rustler Study Area

The Rustler data set, which had paved parking and flat roof commercial source areas, contained 68 runoff values and 67 suspended solids values. The average runoff depth was 87% of the average rainfall depth. The percent difference between the observed and predicted runoff total depth and the runoff average depth was 0% for all data, and 1% for the data set less two outliers, indicating that the outliers did not affect model runoff prediction. The coefficient of variation for both sets of runoff data were virtually identical.

The percent difference between the observed and predicted suspended solids total values and the average suspended solids values for all data was 24%. This was reduced to 4% after two outliers were removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.5 Hastings Study Area, 1980-1982 Data

The 1980 to 1982 Hastings data set, which has source areas associated with residential land uses, contained 44 runoff and suspended solids values. The average runoff depth was 37% of the average rainfall depth. The percent difference between the observed and predicted runoff total depth and the runoff average depth was 7% and 9% respectively, for all data, and 8% and 9% respectively for the data set less one outliers indicating that the outlier only slightly affected model runoff prediction. The coefficient of variation for both sets of runoff data were similar.

The percent difference between the observed and predicted suspended solids total values and the average suspended solids values for all data was 18%. This was reduced to 3% and 2%, respectively, after one outlier was removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.6 Burbank Study Area

The Burbank data set, which has source areas associated with residential land uses, contained 51 runoff and suspended solids values. The average runoff depth was 36% of the average rainfall depth. The percent difference between the observed and predicted runoff total depth and the runoff average depth was 9% and 8% respectively, for all data, and 8% and 6% respectively for the data set less three outliers, indicating that the outliers only slightly affected model runoff prediction. The coefficient of variation for both sets of runoff data were similar.

The model underpredicted the suspended solids total values and the average suspended solids values for all data by 11%, and overpredicted the total and average values by 37% after the three outliers were removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.7 State Fair Study Area

The State Fair data set, which has source areas associated with residential and commercial land uses, contained 46 runoff and suspended solids values. The average runoff depth was 67% of the average rainfall depth. The percent difference between the observed and predicted runoff total depth and the runoff average depth was 9% and 10% respectively, for all data, and 8% and 7% respectively for the data set less one outlier, indicating that the outlier only slightly affected model runoff prediction. The coefficient of variation for both sets of runoff data were similar.

The model underpredicted the suspended solids total values and the average suspended solids values for all data by 4%, and overpredicted the total and average values by 9% after the outlier was removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.8 Wood Center Study Area, 1980-1982 Data

The Wood Center data set, which has source areas associated with residential, commercial, and industrial land uses, contained 61 runoff and suspended solids values. The average runoff depth was 80% of the average rainfall depth. The percent difference between the observed and predicted runoff total depth and the runoff average depth was 15% and 14% respectively, for all data, and 15% and 13% respectively for the data set less two outliers, indicating that the outliers only slightly affected model runoff prediction. The coefficient of variation for both sets of runoff data were virtually identical.

The model underpredicted the suspended solids total values and the average suspended solids values for all data by 16%, and nearly matched the observed total and average values after the two outliers were removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.9 Hastings Study Area, 1990 Data

The 1990 Hastings data set, which has source areas identical to the 1980-1982 data set, contained 13 runoff and suspended solids values. The average observed runoff depth was 48% of the observed average rainfall depth, 11% more than the runoff-to-rain ratio found in the 1980-1982 Hastings data set. The model underpredicted the total and average runoff depths by 28% and 29% respectively, for all data, and 3% and 5% respectively for the data set less two outliers. This indicated that the outliers had an effect on model runoff prediction. The difference between the coefficient of variation for the complete data set was 0.40, while the difference between the coefficient of variation for the data set less outliers was 0.04, indicating that the outliers had a considerable affect upon the data scatter. This is to be expected in a small data set.

The model underpredicted the suspended solids total values and the average suspended solids values for all data by 61%, and overpredicted the suspended solids values by 15% after the two outliers were removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation for both the full and truncated data sets, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.10 Wood Center Study Area, 1990 Data

The 1990 Wood Center data set, which has source areas identical to the 1980-1982 data set, contained 19 runoff and 16 suspended solids values. The average observed runoff depth was 54% of the observed average rainfall depth, 6% more than the runoff-to-rain ratio found in the 1980-1982 Wood Center data set. The model overpredicted the total and average runoff depths by 27% for all data, and 24% and 26% respectively for the data set less four outliers. This indicated that the outliers had little effect on model runoff prediction. The difference between the coefficient of variation for the complete data set was 0.06, while the difference between the coefficient of variation for the data set less outliers was 0.08, indicating that the outliers had little affect upon the scatter of the data.

The model overpredicted the suspended solids total values and the average suspended solids values for all data by 22%, and underpredicted the suspended solids values by 5% after the four outliers were removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation for both the full and truncated data sets, indicating that there was greater scatter in the observed data than in the predicted data.

4.2.11 Monroe Street Study Area

The Monroe Street data set contained 10 runoff and 8 suspended solids values. The average observed runoff depth was 12% of the observed average rainfall depth. The model overpredicted the total and average runoff depths by 20% and 25% respectively for all data, and 15% and 0% respectively for the data set less one outlier. This indicated that the outlier had some effect on model runoff prediction. The coefficient of variation for the observed values was similar to the predicted value coefficient of variation for both the complete data set and the truncated data set. This indicated that the predicted runoff scatter was similar to the observed runoff scatter for both the complete data set and the truncated data set.

The model overpredicted the suspended solids total values and the average suspended solids values for all data by 4% and underpredicted the suspended solids values by 9% after the outlier was removed. The coefficient of variation for the observed data set was greater than the predicted value coefficient of variation for both the full and truncated data sets, indicating that there was greater scatter in the observed data than in the predicted data.

The calibrated model nearly exactly reproduced the observed total copper loading for Monroe Street. The calibrated model slightly over-predicted the dissolved copper loading and slightly under-predicted the particulate copper loading. A complete listing of the copper calibration results at the outfall is included in Appendix B.

4.2.12 Syene Road Study Area

The Syene Road data set contained 11 runoff and suspended solids values. The average observed runoff depth was 68% of the observed average rainfall depth. The model underpredicted the total and average runoff depths by 28% and 27% respectively for all data. The coefficient of variation for the observed values was similar to the predicted coefficient of variation for the complete data set, indicating that the predicted runoff scatter was similar to the observed runoff scatter. No outliers were removed from this data set.

The model overpredicted the suspended solids total values and the average suspended solids values for all data by 8%. The coefficient of variation for the observed data set was somewhat greater than the predicted coefficient of variation, indicating that there was greater scatter in the observed data than in the predicted data.

The calibrated model over-predicted the total copper loading at the Syene Road study area by 11% overall, with over-prediction of dissolved copper loading by 21% and over-prediction of particulate copper loading by 5%. A complete listing of the copper calibration results at the outfall is included in Appendix B.

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5

SLAMM MODEL

EXAMPLE APPLICATION

5.1 OBJECTIVE AND PROCEDURE

The example application of the calibrated SLAMM model is intended to illustrate the use and output of the model, and also to illustrate several of the significant features of stormwater runoff quality using the model output. The test sub-basins were drawn from the same geographic area as the calibration data, and also incorporated many of the land uses and source areas which were calibrated in this project.

The input data for the example applications was generated by WDNR, using available land use, soils and mapping/aerial photography data. The input data files were run using the calibrated model by WDNR and Warzyn, and are presented below with a discussion of results.

5.2 EXAMPLE SUB-BASIN DESCRIPTION

Two example sub-basins in the Menomonee River sub-basin were selected by WDNR to provide demonstration applications for SLAMM. These sub-basins are located in the Lilly Creek sub-basin of the Menomonee River watershed, which is located in the Village of Menomonee Falls near the Milwaukee County - Waukesha County border in southeastern Wisconsin. The Lilly Creek sub-basin has a drainage area of approximately six square miles, of which approximately 50% has undergone some form of development.

The two example sub-basins were labeled as LILLYC and LILLYG for use in the model. LILLYC is a 207 acre mixed-land use sub-basin consisting of approximately 44% residential, 6% commercial, 36% industrial, and 14% open space land uses. LILLYG is a 67 acre residential land use sub-basin.

5.3 SLAMM MODEL INPUT

The source areas within each land use were determined by applying land use description base files to measured land use areas for each sub-basin. These files are based upon average source area characteristics for each land use which were developed by WDNR, and contain average fractional unit-area and other source area-specific information needed to create SLAMM site description data files. These source area fractional unit-area values for each land use are multiplied by the measured areas and entered into a site description file for the sub-basin. The two site description files are included in Appendix C, and electronic copies are also included on the diskette in Appendix E.

The rainfall data used in conjunction with the site description file for the demonstration model runs is developed from rainfall data from 1981 collected at Mitchell Field in Milwaukee. This rainfall data file is included in the diskette in Appendix E.

5.4 RESULTS OF EXAMPLE APPLICATION

The application of the SLAMM model to the two sub-basins results in predictions of total runoff, suspended solids loading and copper loading from the sub-basins, as summarized in Table 8. This table indicates one of the primary uses of the model: direct prediction of stormwater pollutant loading rates to sub-basin steams. The loading rates presented in Table 8 would used in the decision-making process to promote particular retrofit or future development area stormwater management practice strategies. The model output for all source areas for each example application is included in Appendix C.

The model output also illustrates several important features typical of urban stormwater, as illustrated in Figures 4 and 5. These figures illustrate that, for both sub-basins, the following are dominant features of stormwater quality:

- Previous areas such as lawns are a large fraction of the sub-basin area, but produce very low suspended solids and copper loading.
- Street areas dominate in the production of pollutants, substantially in excess of their percentage of area in the sub-basins.
- Roof areas (and, to some extent, parking areas) produce substantial runoff, but much lower suspended solids and copper loading than street areas.

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6

CONCLUSIONS

6.1 SLAMM MODEL ACCURACY

The SLAMM Model, as calibrated in this study, was generally accurate in reproducing collected data from the ten sub-basin study areas. Runoff depth data was reproduced to within 15% of the observed-data for all study area sub-basins. The modeled total suspended solids loading was generally within 20% of observed data. Modeled total copper loading for the observed storms for the Syene Road and Monroe Street sub-basins was within 11% of the collected data. These predictive accuracies are appropriate for planning-level analysis of stormwater quality.

6.2 EXTENT OF CALIBRATION

Not all of the source area and land use stormwater quality generation options available in SLAMM could be calibrated given the extent of the study area data. Almost all runoff sources were calibrated, while less than half of the suspended solids and copper sources were calibrated. None of the stormwater management practice algorithms were calibrated due to the lack of data for the practices. Thus, some of the model land use/source area options retain the original parameters developed by WDNR. Further, due to the limited amount of data, none of the source area/land use stormwater quality prediction options that were calibrated were subjected to "blind" verification testing.

6.3 ISSUES TO BE CONSIDERED IN THE FUTURE DEVELOPMENT OF THE SLAMM MODEL

Based on the experience gained during the conduct of this project, the following issues are proposed for consideration as the SLAMM model is further developed. The first set of issues may be regarded as conceptualization issues, which may need much expanded data bases for adequate evaluation. These issues include:

- Adsorption of pollutants to suspended solids may be strongly influenced by the clay mineral and organic matter content of the solids. If data can be obtained for model development, it may be appropriate to model suspended solids generation using several size fractions, and possibly organic matter content classes. Pollutant absorption parameters could then be linked to these size and content classes.

- Because of the general lack of data in many locations in the state, a reduction in the number of parameters describing rainfall/runoff and rainfall/suspended solids generation may be useful. This simplification could take the form of two- or three-parameter analytical expression option in addition to the current procedures.

- The addition of a description of the probability distribution of water quality parameters in the model output would aid the interpretation of possible variations in water quality.

- Since runoff water quality from streets is so large a factor in overall sub-basin response, additional data collection and the refinement of model algorithms should emphasize street areas. A refinement might include increasing the responsiveness of the street source areas in the model to traffic volume.

- Currently, the model allows infiltration rates for pervious areas associated with A/B soils and pervious areas associated with C/D soils. To increase runoff prediction flexibility as additional data becomes available, a modification to the model would be to increase the model runoff prediction ability by allowing the model to predict runoff based upon additional series of infiltration rates, and possibly accounting for antecedent moisture conditions.

- Add control practices such as swales to individual source areas or land uses.

- Link up SLAMM output with an in-stream concentration prediction model by creating a SLAMM output format that would be compatible with the selected in-stream model.

- The balance of the contaminated runoff not accounted for by runoff either evaporates or infiltrates to groundwater. Therefore, the model might be useful as an indicator of potential sources of stormwater contamination in groundwater.

Additional issues are related to the calibration and verification of the SLAMM model as it is currently configured. These issues include:

- Updating and upgrading the existing model documentation.

- The calibration data utilized in this study represents two communities in southern Wisconsin. As such, soils, traffic, urban design or municipal management practices peculiar to the Milwaukee and Madison areas may be implicitly present in the calibrated parameters. A calibration data base drawn from a much wider geographic extent would tend to remove the potential bias in the current calibration.

- Additional data is needed to calibrate several land use/source area combinations. The model should be able to predict contaminant loadings for such pollutants as zinc, copper, chromium, cadmium, BOD, COD, nitrogen, phosphorus, suspended solids, and ammonia.

- Calibration of many management practice parameters may be difficult given the extent of current databases, because there is little data specifically comparing identical sites with and without management practices. Consequently, additional data and analysis of these practices should be performed.

- Development of a large enough database to allow independent calibration/verification analyses would further enhance documentation of the model.

[mad-603-34f]

7

REFERENCES

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WDNR, 1989a. *SLAMM 5 - Source Loading and Management Model, Volume II: Algorithm Documentation,* PUBL-WR-218-89, April, 1989.

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Table 1

Description of Watershed Data Used in SLAMM Model Calibration

Location	Study Area	Land Use	Total Area [ac]	Percent Impervious Area	Source of Data	Sample Period	Number of Storm Events	Stormwater Management Practices used in Calibration
Milwaukee, WI	Post Office	Commercial	12.10	100%	NURP	1980-1982	79	--
Milwaukee, WI	Rustler	Residential	12.40	100%	NURP	1980-1982	68	--
Milwaukee, WI	Hastings	Residential	32.40	48%	NURP	1980-1982	44	Street Sweeping/Catchbasins
					WDNR-USGS	1990	13	
Milwaukee, WI	Burbank	Residential	61.66	48%	NURP	1980-1982	51	Street Sweeping/Catchbasins
Milwaukee, WI	State Fair	Residential	10.41	49%	NURP	1980-1982	46	Street Sweeping/Catchbasins
		Commercial	18.64	87%				
		Total	29.05	73%				
Milwaukee, WI	Wood Center	Residential	16.25	55%	NURP	1980-1982	61	Street Sweeping/Catchbasins
		Commercial	23.17	96%	WDNR-USGS	1990	19	
		Industrial	4.64	100%				
		Total	44.06	81%				
Madison, WI	Monroe Street	Residential	236.43	33%	WDNR-USGS	1991	10	Street Sweeping
		Institutional	1.36	100%				
		Commercial	7.15	100%				
		Total	244.95	35%				
Madison, WI	Syene Road	Industrial	115.72	62%	WDNR-USGS	1991	11	Street Sweeping

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Table 2

Fraction of Roof and Driveway Surfaces not Directly Connected to Storm Sewer System, from Field Observations

Study Area	Source Area	Percent of Source Area Surface not Directly Connected to Storm Sewers	
		Mean	Median
Hastings	Driveways	37	40
	Garage Roofs	87	100
	Residence Roofs	77	100
Burbank	Driveways	36	40
	Garage Roofs	78	100
	Residence Roofs	78	100
State Fair	Garage Roofs	24	25
	Residence Roofs (entire roof)	60	70
	Residence Roofs (front half only)	75	80
Wood Center	Garage Roofs	16	0
	Residence Roofs (entire roof)	45	50
	Residence Roofs (front half only)	46	50

Notes:

(1) Data collected from site visits on July 19, 1991 and August 1, 1991

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Table 3

Summary of SLAMM Model Calibration Results for Total Runoff and Suspended Solids

Study Area	Number of Events	Rainfall Average Depth [in]	Rainfall COV (2)		Runoff Total Depth [in]	Runoff Average Depth [in]	Runoff COV	SS Total SS [lbs]	SS Average SS [lbs]	SS COV
Post Office (All Data)	79	0.57	1.01	Observed	40.83	0.52	1.03	10096	128	1.53
				Predicted	41.56	0.53	1.07	9001	114	1.28
				Residual	-0.73	-0.01	–	1095	14	–
				% Diff	2%	2%	–	11%	11%	–
Post Office (Less Outliers)	78	0.57	1.03	Observed	39.99	0.51	1.05	8808	113	1.28
				Predicted	40.75	0.52	1.08	8827	113	1.29
				Residual	-0.76	-0.01	–	-19	0	–
				% Diff	2%	2%	–	0%	0%	–
Rustler (All Data)	68/67(1)	0.54	0.93	Observed	31.80	0.47	1.05	5898	88	1.81
				Predicted	31.89	0.47	1.02	4510	67	1.15
				Residual	-0.09	0.00	–	1388	21	–
				% Diff	0%	0%	–	24%	24%	–
Rustler (Less Outliers)	66/65(1)	0.52	0.94	Observed	29.25	0.44	1.06	4318	66	1.47
				Predicted	29.42	0.45	1.03	4124	63	1.17
				Residual	-0.17	-0.01	–	194	3	–
				% Diff	1%	2%	–	4%	5%	–
Hastings – NURP (All Data)	44	0.64	1.15	Observed	10.01	0.23	1.83	5018	114	2.10
				Predicted	10.69	0.24	1.72	4107	93	1.48
				Residual	-0.68	-0.02	–	911	21	–
				% Diff	7%	9%	–	18%	18%	–
Hastings – NURP (Less Outliers)	43	0.62	1.18	Observed	9.45	0.22	1.91	3814	89	1.97
				Predicted	10.23	0.24	1.77	3920	91	1.53
				Residual	-0.78	-0.02	–	-106	-2	–
				% Diff	8%	9%	–	3%	2%	–

Table 3

Summary of SLAMM Model Calibration Results for Total Runoff and Suspended Solids

Study Area	Number of Events	Rainfall Average Depth [in]	Rainfall COV (2)		Runoff Total Depth [in]	Runoff Average Depth [in]	Runoff COV	SS Total SS [lbs]	SS Average SS [lbs]	SS COV
Burbank (All Data)	51	0.66	1.19	Observed	12.22	0.24	1.59	19942	391	1.95
				Predicted	13.36	0.26	1.69	17676	347	0.70
				Residual	–1.13	–0.02	–	2266	44	–
				% Diff	9%	8%	–	11%	11%	–
Burbank (Less Outliers)	48	0.52	0.69	Observed	7.97	0.17	0.82	10543	220	1.11
				Predicted	8.58	0.18	0.87	14431	301	0.34
				Residual	–0.61	–0.01	–	–3888	–81	–
				% Diff	8%	6%	–	37%	37%	–
State Fair (All Data)	46	0.45	0.71	Observed	13.66	0.30	0.78	13435	292	1.14
				Predicted	12.49	0.27	0.83	12884	280	0.38
				Residual	1.18	0.03	–	551	12	–
				% Diff	9%	10%	–	4%	4%	–
State Fair (Less Outliers)	45	0.44	0.72	Observed	13.21	0.29	0.79	11578	257	0.93
				Predicted	12.11	0.27	0.84	12571	279	0.39
				Residual	1.10	0.02	–	–993	–22	–
				% Diff	8%	7%	–	9%	9%	–
Wood Center – NURP (All Data)	61	0.55	0.94	Observed	26.87	0.44	1.12	58156	953	1.40
				Predicted	22.94	0.38	1.11	49005	803	0.41
				Residual	3.93	0.06	–	9151	150	–
				% Diff	15%	14%	–	16%	16%	–
Wood Center – NURP (Less Outliers)	59	0.49	0.75	Observed	22.44	0.38	0.88	45996	780	1.17
				Predicted	19.18	0.33	0.86	45391	769	0.35
				Residual	3.26	0.05	–	605	11	–
				% Diff	15%	13%	–	1%	1%	–

Table 3

Summary of SLAMM Model Calibration Results for Total Runoff and Suspended Solids

Study Area	Number of Events	Rainfall Average Depth [in]	Rainfall COV (2)		Runoff Total Depth [in]	Runoff Average Depth [in]	Runoff COV	SS Total SS [lbs]	SS Average SS [lbs]	SS COV
Hastings – WNDR (All Data)	13	0.65	0.44	Observed	4.06	0.31	0.92	2889	222	1.65
				Predicted	2.91	0.22	0.52	1138	88	0.55
				Residual	1.15	0.09	–	1751	135	–
				% Diff	28%	29%	–	61%	61%	–
Hastings – WNDR (Less Outliers)	11	0.60	0.43	Observed	2.32	0.21	0.56	743	68	0.92
				Predicted	2.24	0.20	0.52	858	78	0.55
				Residual	0.08	0.01	–	–115	–10	–
				% Diff	3%	5%	–	15%	15%	–
Wood Center – WDNR (All Data)	19/16(1)	0.68	0.58	Observed	7.02	0.37	0.62	13626	852	1.11
				Predicted	8.91	0.47	0.68	16606	1038	0.25
				Residual	–1.89	–0.10	–	–2980	–186	–
				% Diff	27%	27%	–	22%	22%	–
Wood Center – WDNR (Less Outliers)	15/12(1)	0.70	0.59	Observed	5.89	0.39	0.61	12936	1078	0.92
				Predicted	7.32	0.49	0.69	12303	1025	0.20
				Residual	–1.43	–0.10	–	633	53	–
				% Diff	24%	26%	–	5%	5%	–
Monroe Street (All Data)	10/8(1)	0.33	0.76	Observed	0.44	0.04	0.87	8142	1018	1.22
				Predicted	0.53	0.05	0.89	8452	1056	0.37
				Residual	–0.09	–0.01	–	–310	–39	–
				% Diff	20%	25%	–	4%	4%	–
Monroe Street (Less Outliers)	9/7(1)	0.28	0.72	Observed	0.33	0.04	0.90	7882	1126	1.15
				Predicted	0.38	0.04	0.86	7139	1020	0.39
				Residual	–0.05	0.00	–	743	106	–
				% Diff	15%	0%	–	9%	9%	–

Table 3

Summary of SLAMM Model Calibration Results for Total Runoff and Suspended Solids

Study Area	Number of Events	Rainfall Average Depth [in]	Rainfall COV (2)		Runoff Total Depth [in]	Runoff Average Depth [in]	Runoff COV	Suspended Solids (SS) Total SS [lbs]	Suspended Solids (SS) Average SS [lbs]	Suspended Solids (SS) COV
Syene Road (All Data)	11	0.54	0.77	Observed	4.12	0.37	0.96	10536	958	0.84
				Predicted	2.97	0.27	0.84	11351	1032	0.59
				Residual	1.15	0.10	–	–815	–74	–
				% Diff	28%	27%	–	8%	8%	–
Syene Road (Less Outliers)				Observed						
				Predicted						
				Residual						
				% Diff						

Notes:
1) 66/65 – Number of runoff events/Number of Suspended Solids events
2) COV – Coefficient of Variation, defined as Standard Deviation divided by Mean
3) % Diff = Absolute Value of Residual divided by Observed Value

12/06/91 JGV/RTB filename: SUMTABL1.CAL

Table 4

Summary of SLAMM Model Calibration Results for Copper

Study Area	Number of Events		Total Copper [lbs]	Dissolved Copper [lbs]	Particulate Copper [lbs]
Monroe Street	8	Observed	0.341	0.100	0.241
		Predicted	0.346	0.111	0.233
		Residual	-0.005	-0.011	0.008
		% Diff	1%	11%	3%
Syene Road	6	Observed	0.312	0.117	0.195
		Predicted	0.347	0.141	0.205
		Residual	-0.035	-0.024	-0.010
		% Diff	11%	21%	5%

Notes:

1) Residuals = Observed value less Predicted value
2) % Diff = Absolute Value of Residuals divided by Observed Value

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Table 5

Runoff Sources Areas Calibrated for Runoff Generation in SLAMM

Runoff Source	Calibrated	Not Calibrated
Connected Flat Roofs	X	
Connected Pitched Roofs	X	
Directly Connected Impervious Areas	X	
Directly Connected Unpaved Areas	(1)	
Pervious Areas - A/B Soils	(1)	
Pervious Areas - C/D Soils	X	
Smooth Textured Streets	X	
Intermediate Textured Streets	X	
Rough Textured Streets		X
Drainage Modifier:		
C/D Soils, w/o Alleys, Medium to High Density Land Use	X	
C/D Soils, w/Alleys, Medium to High Density Land Use	X	
C/D Soils for Ship Commercial and Shopping Center Land Uses		X

NOTES:

(1) Uncertain calibration only, due to sparse data.
(2) Note that runoff production is not dependent on land use.

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Table 6

SLAMM Source Areas Calibrated for Suspended Solids Loading

Source Areas	Land Uses: Residential	Institutional	Commercial	Industrial	Open Spaces	Freeways
Roofs	X	(1)	X	X		
Paved Parking/Storage		(1)	X	X		
Unpaved Parking/Storage			(1)			
Playgrounds						
Driveways	X					
Sidewalks	X		X	(1)		
Streets - Smooth (2)	X		X	X		
Streets - Intermedials (2)	X		X	X		
Streets - Rough (2)						
Large Landscaped Areas (3)						
Undeveloped Areas						
Small Landscaped Areas (3)	X		(1)	X		
Freeway Lanes/Shoulders						

NOTES:

1. Uncertain calibration due to sparse data.
2. All street area calibrations included some level of street sweeping; see text.
3. All landscaped areas are assumed to generate similar levels of suspended solids.

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Table 7

SLAMM Source Areas Calibrated for Copper Loading

Source Areas	Land Uses					
	Residential	Institutional	Commercial	Industrial	Open Spaces	Freeways
Roofs	X	(1)	X	X		
Paved Parking/Storage	X	(2)	X	X		
Unpaved Parking/Storage				(5)		
Playgrounds						
Driveways	X			(3)		
Sidewalks	(3)		(3)			
Streets	X		X	X		
Large Landscaped Areas	(4)			(4)		
Undeveloped Areas						
Small Landscaped Areas	X			(4)		

Notes:
(1) Calibration based upon commercial roof data.
(2) Calibration based upon commercial paved parking/storage data.
(3) Calibration based upon residential driveway data.
(4) Calibration based upon residential small landscaped area data.
(5) Calibration based upon industrial paved parking/storage data.
(6) Calibration includes both particulates and dissolved forms of copper.

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TABLE 8

Results of the SLAMM Model Application to Example Watersheds

		Model Total Loading Results			
Lilly Creek Sub-basin	Area (acres)	Rainfall (in.)	Total Runoff (cf)	Suspended Solids Loading (lbs)	Total Copper Loading (lbs)
LILLYC	207.72	30.36	9361171	179600	15.96
LILLYG	67.02	30.36	1810307	16292	0.86

Note:

1) Rainfall file used was typical for annual rainfall in the Milwaukee area.

2) Runoff and loading values are totals before outfall control reduction or delivery system reductions are applied by the model.

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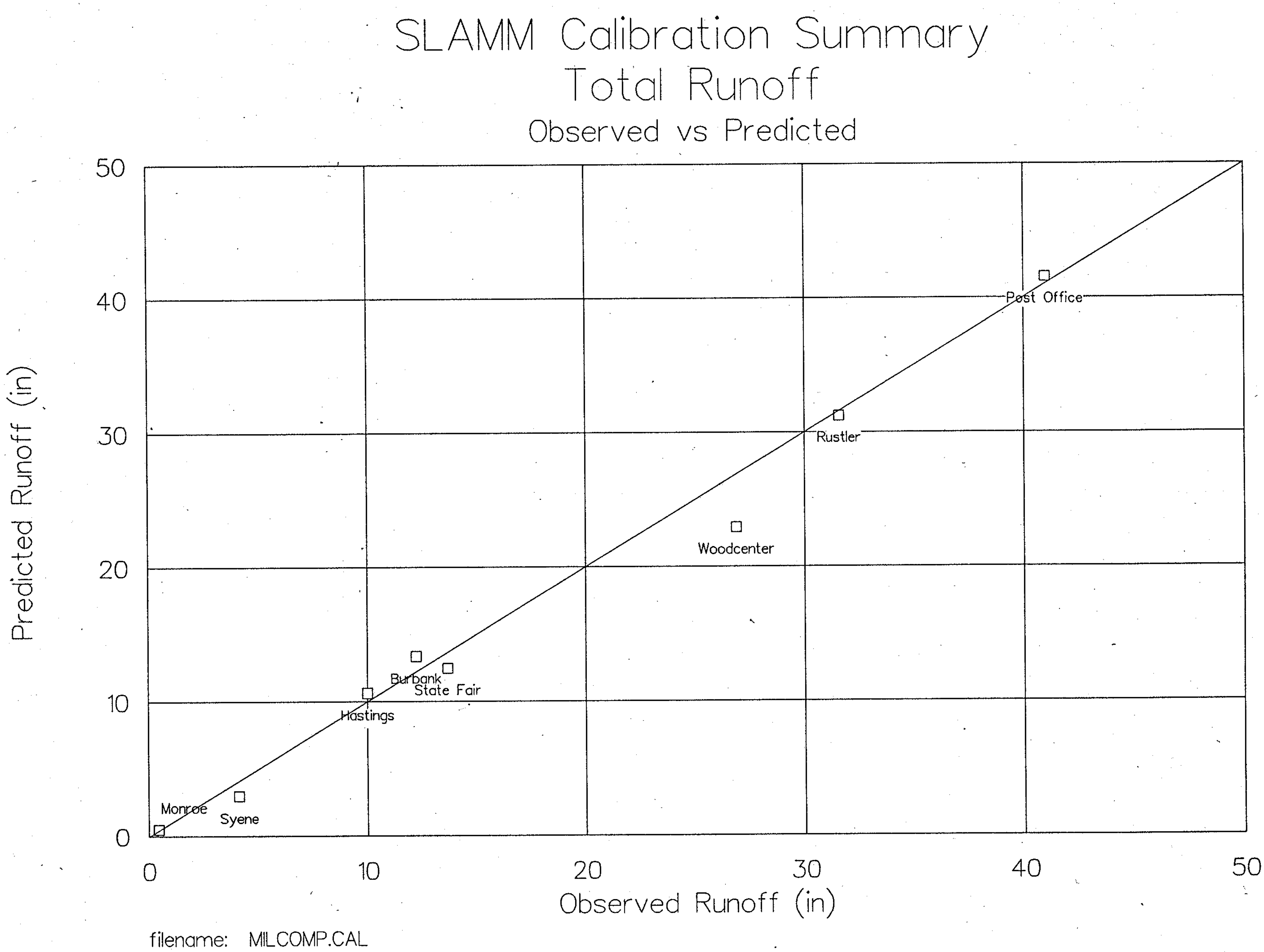

Figure 1: SLAMM Calibration Summary Results: Total Runoff

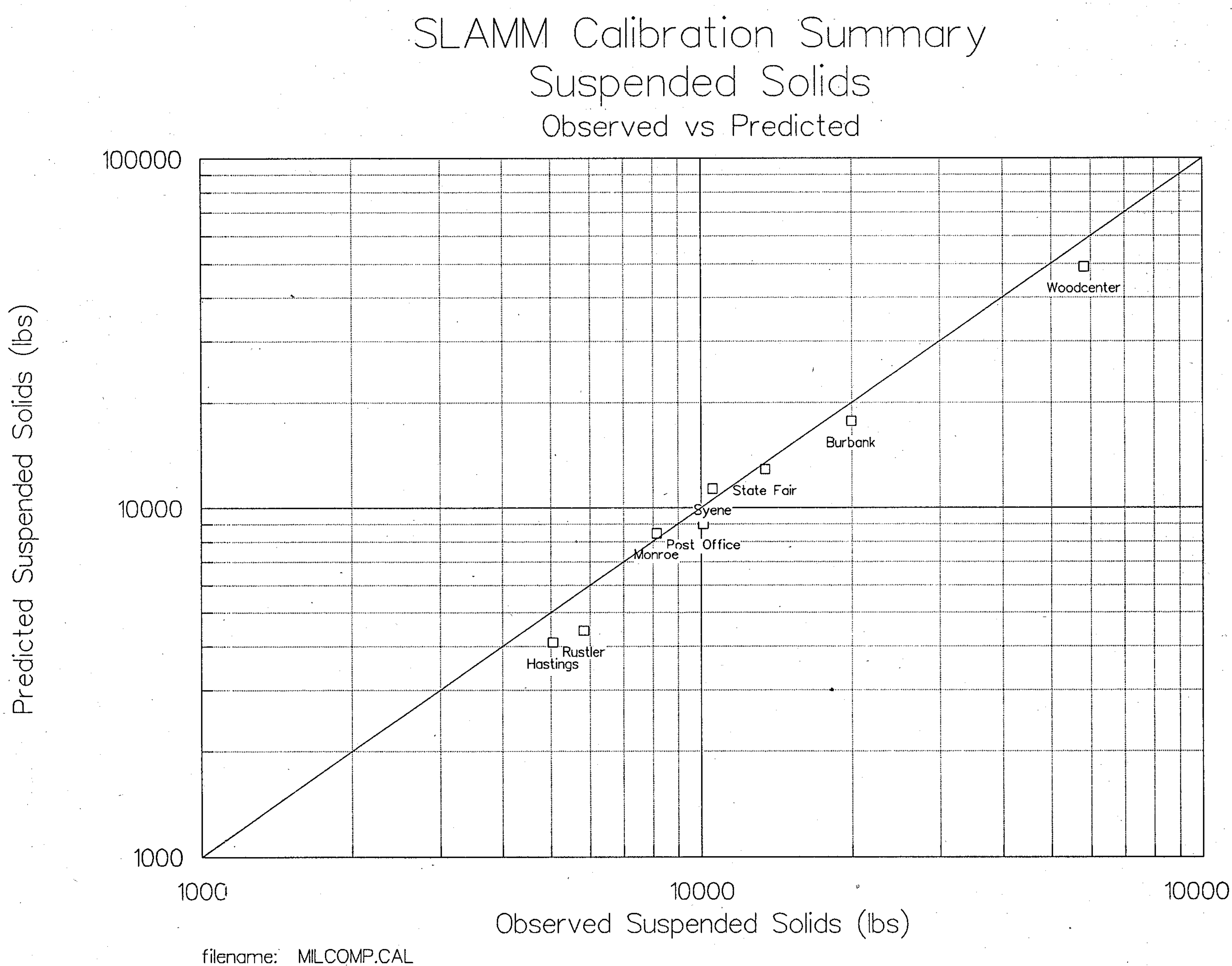

Figure 2: SLAMM Calibration Summary Results: Suspended Solids

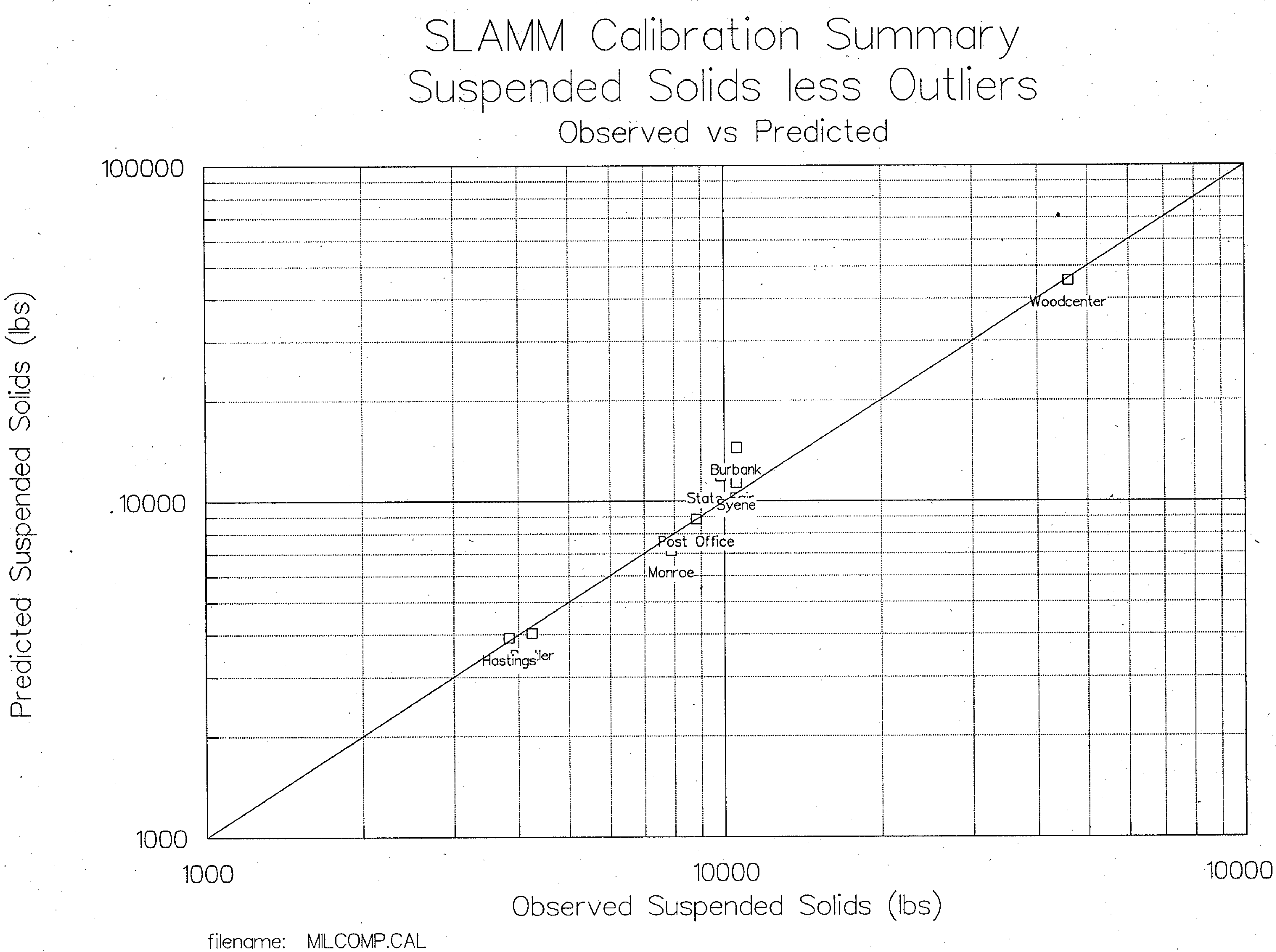

Figure 3: SLAMM Calibration Summary Results: Suspended Solids Less Outliers

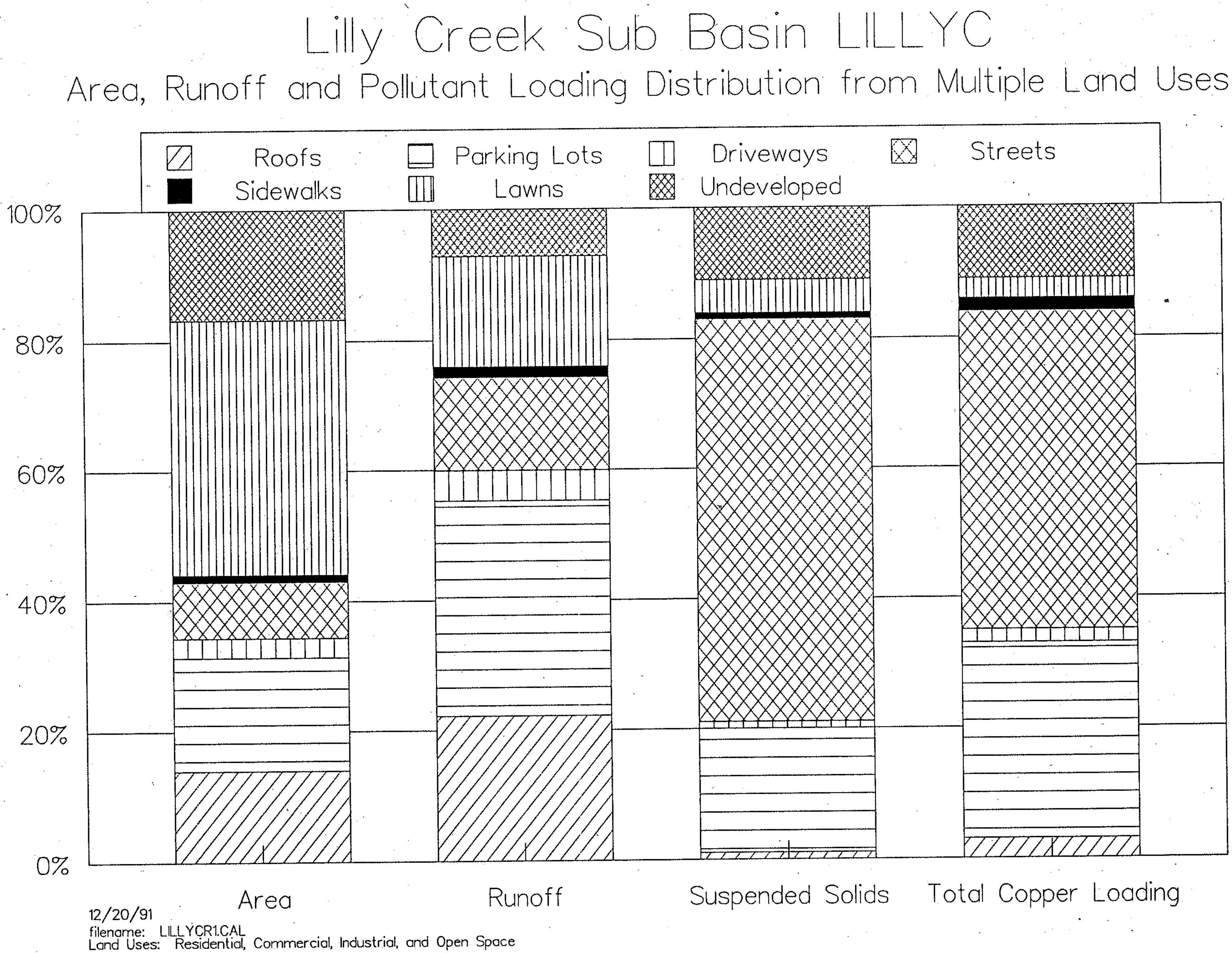

Figure 4: Lilly Creek Sub-Basin LILLYC Demonstration Model Run Results

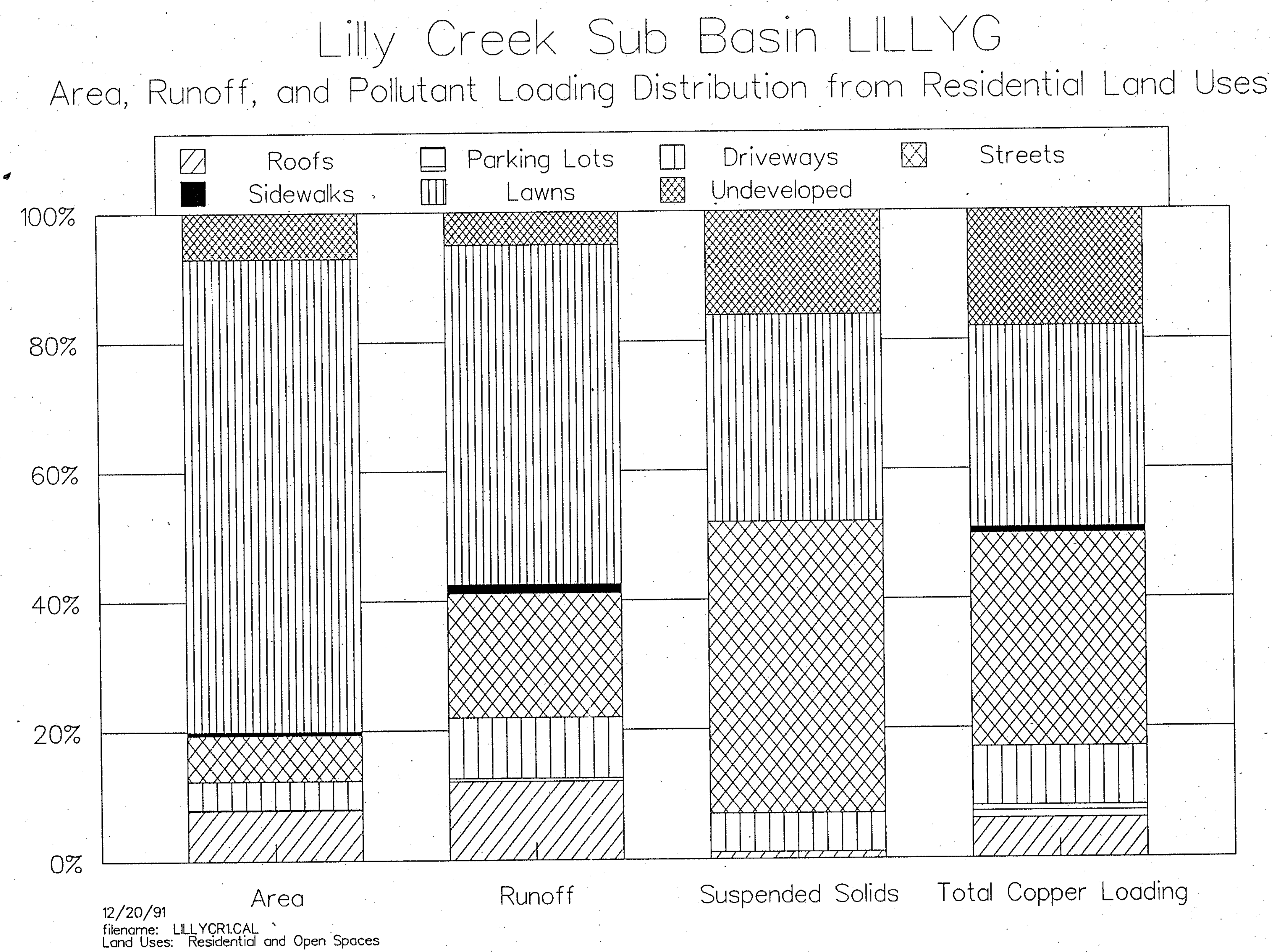

Figure 5: Lilly Creek Sub-Basin LILLYG Demonstration Model Run Results

Appendix A

Source Area Description Files and Parameter Files

A1 - Source Area Description Files
A2 - Parameter Files

A1

Source Area Description Files

Data file name: POST00.DAT
Rain file name: PFINAL1.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 04/01/80
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL
Study period ending date: 06/30/82
Time: 14:23:39

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
   Curb and Gutters, 'valleys', or sealed swales in:
   3. Poor condition (or very flat) .25
   4. Fair condition .75
   5. Good condition (or very steep) 0

Site information: MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	0.00	0.00	0.00	0.00	0.00
Roofs 2	0.00	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	12.10	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	0.00	0.00	0.00	0.00	0.00
Driveways 2	0.00	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 2	0.00	0.00	0.00	0.00	0.00
Street Area 1	0.00	0.00	0.00	0.00	0.00
Street Area 2	0.00	0.00	0.00	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
	--------	--------	--------	--------	--------
Total	0.00	0.00	12.10	0.00	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	

Total	

Total of All Source Areas 12.10

Total of All Source Areas
less All Isolated Areas 12.10
=========

Source Area Control Practice Information

Commercial Areas
Paved Parking/Storage 1   Source area number: 66
The Source Area is directly connected or draining to a directly conntected area

Catchbasin or Drainage Controls

Outfall Controls

Data file name: RUST00.DAT
Rain file name: RUST1.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 04/01/80
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL
Study period ending date: 06/30/82
Time: 14:24:25

Fraction of each type of Drainage System serving study area:

1. Grass Swales 0
2. Undeveloped roadside 0

Curb and Gutters, 'valleys', or sealed swales in:

3. Poor condition (or very flat) 0
4. Fair condition 1
5. Good condition (or very steep) 0

Site information: MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	0.00	0.00	5.26	0.00	0.00
Roofs 2	0.00	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	7.14	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	0.00	0.00	0.00	0.00	0.00
Driveways 2	0.00	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 2	0.00	0.00	0.00	0.00	0.00
Street Area 1	0.00	0.00	0.00	0.00	0.00
Street Area 2	0.00	0.00	0.00	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	12.40	0.00	0.00

Freeway Source Area	Area
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 12.40

Total of All Source Areas less All Isolated Areas 12.40

Source Area Control Practice Information

Commercial Areas

Roofs 1 Source area number: 61
The roof is flat
The Source Area is directly connected or draining to a directly conntected area

Paved Parking/Storage 1 Source area number: 66
The Source Area is directly connected or draining to a directly conntected area

Catchbasin or Drainage Controls

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: HAST00.DAT
Rain file name: HAST1.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 06/01/80
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL

Study period ending date: 06/30/82
Time: 14:24:38

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
Curb and Gutters, 'valleys', or sealed swales in:
3. Poor condition (or very flat) 1
4. Fair condition 0
5. Good condition (or very steep) 0

Site information: HAST9.DAT W/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	1.35	0.00	0.00	0.00	0.00
Roofs 2	5.07	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	2.67	0.00	0.00	0.00	0.00
Driveways 2	1.95	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 2	0.00	0.00	0.00	0.00	0.00
Street Area 1	4.40	0.00	0.00	0.00	0.00
Street Area 2	0.00	0.00	0.00	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	16.79	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.17	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	32.40	0.00	0.00	0.00	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 32.40

Total of All Source Areas less All Isolated Areas 32.23

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Driveways 2 Source area number: 14
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Street Area 1 Source area number: 18
1. Street Texture: intermediate

MA3199-27

2. Total study area street length (curb-miles): 2.25
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning

1. Street cleaning schedule:

Begin cleaning on: 04/15/80	Schedule: Every 2 weeks (Wed)
Begin cleaning on: 10/30/80	Schedule: None
Begin cleaning on: 03/13/81	Schedule: 2 Passes/week (Tue,Thur)
Begin cleaning on: 05/14/81	Schedule: Every 4 weeks (Wed)
Begin cleaning on: 06/28/81	Schedule: 2 Passes/week (Tue,Thur)
Begin cleaning on: 07/18/81	Schedule: None
Begin cleaning on: 10/05/81	Schedule: 2 Passes/week (Tue,Thur)
Begin cleaning on: 11/14/81	Schedule: None
Begin cleaning on: 04/15/82	Schedule: Every 2 weeks (Wed)

Final cleaning period ending date: 06/30/82

2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? Yes
5. Equation coefficient M (slope): 9.000001E-02
6. Equation coefficient B (intercept): 580

Smll Lndscpd Area 1 Source area number: 24

The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls

Control Practice 1 : Catchbasin Cleaning Controls

1. Total sump volume (cubic feet)= 306
2. Area served by catchbasins (acres)= 32.23
3. Percent of sump volume full at beginning of study period= 0 %
4. Number of times catchbasins cleaned each year= 0

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: HAST103.DAT
Rain file name: HAST90.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 02/01/90
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL
Study period ending date: 08/30/90
Time: 14:24:50

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
Curb and Gutters, 'valleys', or sealed swales in:
3. Poor condition (or very flat) 1
4. Fair condition 0
5. Good condition (or very steep) 0

Site information: HAST102.DAT W/ MILW6.RSV, DELIV2.PRR, MILW11.PSC

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	1.35	0.00	0.00	0.00	0.00
Roofs 2	5.07	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	2.67	0.00	0.00	0.00	0.00
Driveways 2	1.95	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 2	0.00	0.00	0.00	0.00	0.00
Street Area 1	4.40	0.00	0.00	0.00	0.00
Street Area 2	0.00	0.00	0.00	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	16.79	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.17	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	32.40	0.00	0.00	0.00	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	---
Total	

Total of All Source Areas 32.40

Total of All Source Areas less All Isolated Areas 32.23

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Driveways 2 Source area number: 14
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Street Area 1 Source area number: 18
1. Street Texture: intermediate

HAST103.DAT

2. Total study area street length (curb-miles): 2.25
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning
1. Street cleaning schedule:
   Begin cleaning on: 04/15/90   Schedule: Every 4 weeks (Wed)
   Final cleaning period ending date: 08/30/90
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450

Smll Lndscpd Area 1   Source area number: 24
The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls

Control Practice 1 : Catchbasin Cleaning Controls
1. Total sump volume (cubic feet)= 306
2. Area served by catchbasins (acres)= 32.23
3. Percent of sump volume full at beginning of study period= 0 %
4. Number of times catchbasins cleaned each year= 0

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: BURB00.DAT
Rain file name: BURB2.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 06/01/80
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL

Study period ending date: 05/30/82
Time: 14:25:07

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
Curb and Gutters, 'valleys', or sealed swales in:
3. Poor condition (or very flat) 0
4. Fair condition 0
5. Good condition (or very steep) 1

Site information: BURB15.DAT W/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	2.44	0.00	0.00	0.00	0.00
Roofs 2	9.05	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	4.80	0.00	0.00	0.00	0.00
Driveways 2	3.36	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 2	0.00	0.00	0.00	0.00	0.00
Street Area 1	9.64	0.00	0.00	0.00	0.00
Street Area 2	0.00	0.00	0.00	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	32.10	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.27	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	61.66	0.00	0.00	0.00	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 61.66

Total of All Source Areas less All Isolated Areas 61.39

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Driveways 2 Source area number: 14
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Street Area 1 Source area number: 18
1. Street Texture: intermediate

BURBØØ.DAT

2. Total study area street length (curb-miles): 4.18
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning

1. Street cleaning schedule:
   Begin cleaning on: 04/15/80 Schedule: Every 4 weeks (Wed)
   Begin cleaning on: 11/1/80 Schedule: None
   Begin cleaning on: 04/15/81 Schedule: Every 4 weeks (Wed)
   Begin cleaning on: 11/1/81 Schedule: None
   Begin cleaning on: 04/15/82 Schedule: Every 4 weeks (Wed)
   Final cleaning period ending date: 05/30/82
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450

Smll Lndscpd Area 1 Source area number: 24
The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls

Control Practice 1 : Catchbasin Cleaning Controls

1. Total sump volume (cubic feet)= 583
2. Area served by catchbasins (acres)= 61.39
3. Percent of sump volume full at beginning of study period= 0 %
4. Number of times catchbasins cleaned each year= 0

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: SF00.DAT
Rain file name: SF1.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 04/15/80
Date: 11-30-1991.

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL

Study period ending date: 12/31/82
Time: 14:25:20

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
Curb and Gutters, 'valleys', or sealed swales in:
3. Poor condition (or very flat) 0
4. Fair condition 0
5. Good condition (or very steep) 1

Site information: SF9.DAT W/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	0.86	0.00	4.72	0.00	0.00
Roofs 2	1.58	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	4.67	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.34	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	0.41	0.00	0.00	0.00	0.00
Driveways 2	0.00	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.20	0.00	1.36	0.00	0.00
Sidewalks/Walks 2	0.20	0.00	0.00	0.00	0.00
Street Area 1	1.55	0.00	4.86	0.00	0.00
Street Area 2	0.28	0.00	0.00	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	5.32	0.00	2.42	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.27	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	10.41	0.00	18.64	0.00	0.00

Total of All Source Areas 29.05

Total of All Source Areas less All Isolated Areas 29.05

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Source Area Control Practice Information

Residential Areas
Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area
Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present
Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 1 Source area number: 16
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2 Source area number: 17
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present

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```
   Street Area 1    Source area number:  18
          1.  Street Texture:  intermediate
          2.  Total study area street length (curb-miles):  .61
          3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
          4.  Street Dirt Accumulation:
                Default value used
      Control Practice:  Street Cleaning
          1. Street cleaning schedule:
               Begin cleaning on: 03/18/80    Schedule:  2 Passes/week (Tue,Thur)
               Begin cleaning on: 11/01/80    Schedule:  None
               Begin cleaning on: 03/18/81    Schedule:  2 Passes/week (Tue,Thur)
               Begin cleaning on: 11/14/81    Schedule:  None
               Begin cleaning on: 04/01/82    Schedule:  2 Passes/week (Tue,Thur)
               Final cleaning period ending date:  10/15/82
          2. Street cleaner productivity:  Default
          3. Parking density:  Medium
          4. Parking controls imposed?  No
          5. Equation coefficient M (slope):   .65
          6. Equation coefficient B (intercept):   220
   Street Area 2    Source area number:  19
          1.  Street Texture:  smooth
          2.  Total study area street length (curb-miles):  .11
          3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
          4.  Street Dirt Accumulation:
                Default value used
      Control Practice:  Street Cleaning
          1. Street cleaning schedule:
               Begin cleaning on: 03/18/80    Schedule:  2 Passes/week (Tue,Thur)
               Begin cleaning on: 11/01/80    Schedule:  None
               Begin cleaning on: 03/18/81    Schedule:  2 Passes/week (Tue,Thur)
               Begin cleaning on: 11/14/81    Schedule:  None
               Begin cleaning on: 04/01/82    Schedule:  2 Passes/week (Tue,Thur)
               Final cleaning period ending date:  11/01/82
          2. Street cleaner productivity:  Default
          3. Parking density:  Medium
          4. Parking controls imposed?  No
          5. Equation coefficient M (slope):   .71
          6. Equation coefficient B (intercept):   70
   Smll Lndscpd Area 1    Source area number:  24
         The SCS Hydrologic Soil Type is C/D

Commercial Areas
   Roofs 1    Source area number:  61
         The roof is flat
         The Source Area is directly connected or draining to a directly conntected area
   Paved Parking/Storage 1    Source area number:  66
         The Source Area is directly connected or draining to a directly conntected area
   Unpaved Parking/Storage 1    Source area number:  69
         The Source Area is directly connected or draining to a directly conntected area
   Sidewalks/Walks 1    Source area number:  76
         The Source Area is directly connected or draining to a directly conntected area
   Street Area 1    Source area number:  78
          1.  Street Texture:  intermediate
          2.  Total study area street length (curb-miles):  1.48
          3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
          4.  Street Dirt Accumulation:
                Default value used
      Control Practice:  Street Cleaning
          1. Street cleaning schedule:
               Begin cleaning on: 03/18/80    Schedule:  2 Passes/week (Tue,Thur)
               Begin cleaning on: 11/01/80    Schedule:  None
               Begin cleaning on: 03/18/81    Schedule:  2 Passes/week (Tue,Thur)
               Begin cleaning on: 11/14/81    Schedule:  None
               Begin cleaning on: 04/01/82    Schedule:  2 Passes/week (Tue,Thur)
               Final cleaning period ending date:  10/15/82
          2. Street cleaner productivity:  Default
          3. Parking density:  Extensive (short term
          4. Parking controls imposed?  No
          5. Equation coefficient M (slope):   .59
          6. Equation coefficient B (intercept):   260
   Smll Lndscpd Area 1    Source area number:  84
         The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls
      Control Practice 1 :  Catchbasin Cleaning Controls
       1.  Total sump volume (cubic feet)=  100
       2.  Area served by catchbasins (acres)=  29.05
       3.  Percent of sump volume full at beginning of study period=  0 %
       4.  Number of times catchbasins cleaned each year=  0
```

SFØØ.DAT

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: WCEN00.DAT
Rain file name: WCEN1.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 02/01/80
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL
Study period ending date: 12/31/82
Time: 14:25:37

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
Curb and Gutters, 'valleys', or sealed swales in:
3. Poor condition (or very flat) 0
4. Fair condition 0
5. Good condition (or very steep) 1

Site information: WCEN6.DAT W/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	2.74	0.00	4.24	1.20	0.00
Roofs 2	1.89	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	4.66	2.73	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.90	0.00	0.89	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	0.68	0.00	0.00	0.00	0.00
Driveways 2	0.00	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.21	0.00	3.08	0.21	0.00
Sidewalks/Walks 2	0.21	0.00	0.10	0.00	0.00
Street Area 1	2.00	0.00	7.90	0.43	0.00
Street Area 2	0.35	0.00	1.40	0.07	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	7.27	0.00	0.90	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	16.25	0.00	23.17	4.64	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 44.06

Total of All Source Areas less All Isolated Areas 44.06

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present

Unpaved Parking/Storage 1 Source area number: 9
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Sidewalks/Walks 1 Source area number: 16
The Source Area is directly connected or draining to a directly conntected area

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Sidewalks/Walks 2   Source area number: 17
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present

Street Area 1   Source area number: 18
1. Street Texture: intermediate
2. Total study area street length (curb-miles): .69
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning
1. Street cleaning schedule:
   Begin cleaning on: 04/15/80   Schedule: Every 4 weeks (Wed)
   Begin cleaning on: 11/01/80   Schedule: None
   Begin cleaning on: 03/18/81   Schedule: Every 4 weeks (Wed)
   Begin cleaning on: 11/14/81   Schedule: None
   Begin cleaning on: 04/01/81   Schedule: Every 4 weeks (Wed)
   Final cleaning period ending date: 10/15/82
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope): .65
6. Equation coefficient B (intercept): 220

Street Area 2   Source area number: 19
1. Street Texture: smooth
2. Total study area street length (curb-miles): .12
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning
1. Street cleaning schedule:
   Begin cleaning on: 04/15/80   Schedule: Every 4 weeks (Wed)
   Begin cleaning on: 11/01/81   Schedule: None
   Begin cleaning on: 03/18/81   Schedule: Every 4 weeks (Wed)
   Begin cleaning on: 11/14/81   Schedule: None
   Begin cleaning on: 04/01/82   Schedule: Every 4 weeks (Wed)
   Final cleaning period ending date: 10/15/82
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope): .71
6. Equation coefficient B (intercept): 70

Smll Lndscpd Area 1   Source area number: 24
The SCS Hydrologic Soil Type is C/D

Commercial Areas

Roofs 1   Source area number: 61
The roof is flat
The Source Area is directly connected or draining to a directly conntected area

Paved Parking/Storage 1   Source area number: 66
The Source Area is directly connected or draining to a directly conntected area

Unpaved Parking/Storage 1   Source area number: 69
The Source Area is directly connected or draining to a directly conntected area

Sidewalks/Walks 1   Source area number: 76
The Source Area is directly connected or draining to a directly conntected area

Sidewalks/Walks 2   Source area number: 77
The Source Area is directly connected or draining to a directly conntected area

Street Area 1   Source area number: 78
1. Street Texture: intermediate
2. Total study area street length (curb-miles): 2.75
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning
1. Street cleaning schedule:
   Begin cleaning on: 04/15/80   Schedule: 1 Pass/week (Wed)
   Begin cleaning on: 11/01/80   Schedule: None
   Begin cleaning on: 03/18/81   Schedule: 1 Pass/week (Wed)
   Begin cleaning on: 11/14/81   Schedule: None
   Begin cleaning on: 04/01/82   Schedule: 1 Pass/week (Wed)
   Final cleaning period ending date: 11/15/82
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope): .65
6. Equation coefficient B (intercept): 220

Street Area 2   Source area number: 79
1. Street Texture: smooth
2. Total study area street length (curb-miles): .48

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        3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
        4.  Street Dirt Accumulation:
              Default value used
    Control Practice:  Street Cleaning
        1. Street cleaning schedule:
             Begin cleaning on: 04/15/80    Schedule:  1 Pass/week (Wed)
             Begin cleaning on: 11/01/80    Schedule:  None
             Begin cleaning on: 03/18/81    Schedule:  1 Pass/week (Wed)
             Begin cleaning on: 11/14/81    Schedule:  None
             Begin cleaning on: 04/01/82    Schedule:  1 Pass/week (Wed)
             Final cleaning period ending date:  10/15/82
        2. Street cleaner productivity:  Default
        3. Parking density:  Medium
        4. Parking controls imposed?  No
        5. Equation coefficient M (slope):   .71
        6. Equation coefficient B (intercept):    70
  Smll Lndscpd Area 1    Source area number:  84
        The SCS Hydrologic Soil Type is C/D

Industrial Areas
  Roofs 1    Source area number:  91
        The roof is flat
        The Source Area is directly connected or draining to a directly conntected area
  Paved Parking/Storage 1    Source area number:  96
        The Source Area is directly connected or draining to a directly conntected area
  Sidewalks/Walks 1    Source area number:  106
        The Source Area is directly connected or draining to a directly conntected area
  Street Area 1    Source area number:  108
        1.  Street Texture:  intermediate
        2.  Total study area street length (curb-miles):  .19
        3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
        4.  Street Dirt Accumulation:
              Default value used
    Control Practice:  Street Cleaning
        1. Street cleaning schedule:
             Begin cleaning on: 04/15/80    Schedule:  1 Pass/week (Wed)
             Begin cleaning on: 11/01/80    Schedule:  None
             Begin cleaning on: 03/18/81    Schedule:  1 Pass/week (Wed)
             Begin cleaning on: 11/15/81    Schedule:  None
             Begin cleaning on: 04/01/82    Schedule:  1 Pass/week (Wed)
             Final cleaning period ending date:  10/15/82
        2. Street cleaner productivity:  Default
        3. Parking density:  Extensive (short term
        4. Parking controls imposed?  No
        5. Equation coefficient M (slope):   .59
        6. Equation coefficient B (intercept):   260
  Street Area 2    Source area number:  109
        1.  Street Texture:  smooth
        2.  Total study area street length (curb-miles):  .03
        3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
        4.  Street Dirt Accumulation:
              Default value used
    Control Practice:  Street Cleaning
        1. Street cleaning schedule:
             Begin cleaning on: 04/15/80    Schedule:  1 Pass/week (Wed)
             Begin cleaning on: 11/01/80    Schedule:  None
             Begin cleaning on: 03/18/81    Schedule:  1 Pass/week (Wed)
             Begin cleaning on: 11/14/81    Schedule:  None
             Begin cleaning on: 04/01/82    Schedule:  1 Pass/week (Wed)
             Final cleaning period ending date:  10/15/82
        2. Street cleaner productivity:  Default
        3. Parking density:  Extensive (short term
        4. Parking controls imposed?  Extensive (short term
        5. Equation coefficient M (slope):   .68
        6. Equation coefficient B (intercept):   80

Catchbasin or Drainage Controls
    Control Practice 1 :  Catchbasin Cleaning Controls
     1.  Total sump volume (cubic feet)=  280
     2.  Area served by catchbasins (acres)=  44.06
     3.  Percent of sump volume full at beginning of study period=  0 %
     4.  Number of times catchbasins cleaned each year=  0

Outfall Controls

Pollutants to be Analyzed and Printed:

        Pollutant Name              Pollutant Type
        --------------              --------------
        Residue                     Particulate
```

Data file name: WCEN103.DAT
Rain file name: WCEN90.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 12/01/89
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL

Study period ending date: 12/31/90
Time: 14:26:34

Fraction of each type of Drainage System serving study area:

1. Grass Swales 0
2. Undeveloped roadside 0

Curb and Gutters, 'valleys', or sealed swales in:

3. Poor condition (or very flat) 0
4. Fair condition 0
5. Good condition (or very steep) 1

Site information: WCEN102.DAT W/ MILW11.PSC, MILW6.RSV, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	2.74	0.00	4.24	1.20	0.00
Roofs 2	1.89	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	4.66	2.73	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.90	0.00	0.89	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	0.68	0.00	0.00	0.00	0.00
Driveways 2	0.00	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.21	0.00	3.08	0.21	0.00
Sidewalks/Walks 2	0.21	0.00	0.10	0.00	0.00
Street Area 1	2.00	0.00	7.90	0.43	0.00
Street Area 2	0.00	0.00	1.40	0.07	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	7.27	0.00	0.90	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	15.90	0.00	23.17	4.64	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 43.71

Total of All Source Areas less All Isolated Areas 43.71

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present

Unpaved Parking/Storage 1 Source area number: 9
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are present

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Sidewalks/Walks 1 Source area number: 16
The Source Area is directly connected or draining to a directly conntected area

Sidewalks/Walks 2 Source area number: 17

```
        The Source Area is draining to a pervious area (partially connected impervious area)
        The SCS Hydrologic Soil Type is C/D
        The building density is medium or high
        Alleys are present
    Street Area 1    Source area number:  18
           1.  Street Texture:  intermediate
           2.  Total study area street length (curb-miles):  .69
           3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
           4.  Street Dirt Accumulation:
                 Default value used
      Control Practice:  Street Cleaning
           1. Street cleaning schedule:
                Begin cleaning on: 04/15/90    Schedule:  Every 4 weeks (Wed)
                Final cleaning period ending date:  10/15/90
           2. Street cleaner productivity:  Default
           3. Parking density:  Medium
           4. Parking controls imposed?  No
           5. Equation coefficient M (slope):   .65
           6. Equation coefficient B (intercept):   220
    Smll Lndscpd Area 1    Source area number:  24
        The SCS Hydrologic Soil Type is C/D

  Commercial Areas
    Roofs 1    Source area number:  61
        The roof is flat
        The Source Area is directly connected or draining to a directly conntected area
    Paved Parking/Storage 1    Source area number:  66
        The Source Area is directly connected or draining to a directly conntected area
    Unpaved Parking/Storage 1    Source area number:  69
        The Source Area is directly connected or draining to a directly conntected area
    Sidewalks/Walks 1    Source area number:  76
        The Source Area is directly connected or draining to a directly conntected area
    Sidewalks/Walks 2    Source area number:  77
        The Source Area is directly connected or draining to a directly conntected area
    Street Area 1    Source area number:  78
           1.  Street Texture:  intermediate
           2.  Total study area street length (curb-miles):  2.75
           3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
           4.  Street Dirt Accumulation:
                 Default value used
      Control Practice:  Street Cleaning
           1. Street cleaning schedule:
                Begin cleaning on: 04/15/90    Schedule:  1 Pass/week (Wed)
                Final cleaning period ending date:  11/15/90
           2. Street cleaner productivity:  Default
           3. Parking density:  Medium
           4. Parking controls imposed?  No
           5. Equation coefficient M (slope):   .65
           6. Equation coefficient B (intercept):   220
    Street Area 2    Source area number:  79
           1.  Street Texture:  smooth
           2.  Total study area street length (curb-miles):  .48
           3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
           4.  Street Dirt Accumulation:
                 Default value used
      Control Practice:  Street Cleaning
           1. Street cleaning schedule:
                Begin cleaning on: 04/15/90    Schedule:  1 Pass/week (Wed)
                Final cleaning period ending date:  10/15/90
           2. Street cleaner productivity:  Default
           3. Parking density:  Medium
           4. Parking controls imposed?  No
           5. Equation coefficient M (slope):   .71
           6. Equation coefficient B (intercept):   70
    Smll Lndscpd Area 1    Source area number:  84
        The SCS Hydrologic Soil Type is C/D

  Industrial Areas
    Roofs 1    Source area number:  91
        The roof is flat
        The Source Area is directly connected or draining to a directly conntected area
    Paved Parking/Storage 1    Source area number:  96
        The Source Area is directly connected or draining to a directly conntected area
    Sidewalks/Walks 1    Source area number:  106
        The Source Area is directly connected or draining to a directly conntected area
    Street Area 1    Source area number:  108
           1.  Street Texture:  intermediate
           2.  Total study area street length (curb-miles):  .19
           3.  Initial Street Dirt Loading (lbs/curb-mi):  default value
           4.  Street Dirt Accumulation:
```

Default value used

Control Practice: Street Cleaning

1. Street cleaning schedule:
   Begin cleaning on: 04/15/90 Schedule: 1 Pass/week (Wed)
   Final cleaning period ending date: 10/15/90
2. Street cleaner productivity: Default
3. Parking density: Extensive (short term
4. Parking controls imposed? No
5. Equation coefficient M (slope): .59
6. Equation coefficient B (intercept): 260

Street Area 2 Source area number: 109

1. Street Texture: smooth
2. Total study area street length (curb-miles): .03
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning

1. Street cleaning schedule:
   Begin cleaning on: 04/15/90 Schedule: 1 Pass/week (Wed)
   Final cleaning period ending date: 10/15/90
2. Street cleaner productivity: Default
3. Parking density: Extensive (short term
4. Parking controls imposed? Extensive (short term
5. Equation coefficient M (slope): .68
6. Equation coefficient B (intercept): 80

Catchbasin or Drainage Controls

Control Practice 1 : Catchbasin Cleaning Controls

1. Total sump volume (cubic feet)= 280
2. Area served by catchbasins (acres)= 43.71
3. Percent of sump volume full at beginning of study period= 0 %
4. Number of times catchbasins cleaned each year= 0

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: MONROE00.DAT
Rain file name: MONROE92.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 04/01/91
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL

Study period ending date: 07/09/91
Time: 14:26:47

Fraction of each type of Drainage System serving study area:

1. Grass Swales 0
2. Undeveloped roadside .18

Curb and Gutters, 'valleys', or sealed swales in:

3. Poor condition (or very flat) 0
4. Fair condition 0
5. Good condition (or very steep) .82

Site information: MONROE2.DAT W/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	0.59	0.95	1.46	0.00	0.00
Roofs 2	0.15	0.00	0.00	0.00	0.00
Roofs 3	0.50	0.00	0.00	0.00	0.00
Roofs 4	27.03	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.46	0.20	3.16	0.00	0.00
Paved Parking/Storage	0.00	0.21	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	7.73	0.00	0.00	0.00	0.00
Driveways 2	3.42	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	3.04	0.00	0.08	0.00	0.00
Sidewalks/Walks 2	3.04	0.00	0.00	0.00	0.00
Street Area 1	11.79	0.00	1.62	0.00	0.00
Street Area 2	20.16	0.00	0.83	0.00	0.00
Street Area 3	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	21.19	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	131.47	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	5.86	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	236.43	1.36	7.15	0.00	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 244.95

Total of All Source Areas less All Isolated Areas 244.95

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is flat
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is A/B

Roofs 2 Source area number: 2
The roof is flat
The Source Area is directly connected or draining to a directly conntected area

Roofs 3 Source area number: 3
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 4 Source area number: 4
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is A/B

Paved Parking/Storage 1 Source area number: 6
The Source Area is directly connected or draining to a directly conntected area

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Driveways 2 Source area number: 14
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is A/B
Sidewalks/Walks 1 Source area number: 16
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2 Source area number: 17
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is A/B
Street Area 1 Source area number: 18
1. Street Texture: intermediate
2. Total study area street length (curb-miles): 4.66
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/91 Schedule: Every 4 weeks (Wed)
Final cleaning period ending date: 11/15/91
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): 9.000001E-02
6. Equation coefficient B (intercept): 580
Street Area 2 Source area number: 19
1. Street Texture: intermediate
2. Total study area street length (curb-miles): 11.12
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/91 Schedule: Every 4 weeks (Wed)
Final cleaning period ending date: 11/15/91
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): 9.000001E-02
6. Equation coefficient B (intercept): 580
Lrg Lndscpd Area 1 Source area number: 21
The SCS Hydrologic Soil Type is A/B
Smll Lndscpd Area 1 Source area number: 24
The SCS Hydrologic Soil Type is A/B
Other Pervious Area Source area number: 28
The SCS Hydrologic Soil Type is A/B

Institutional Areas
Roofs 1 Source area number: 31
The roof is flat
The Source Area is directly connected or draining to a directly conntected area
Paved Parking/Storage 1 Source area number: 36
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is A/B
Paved Parking/Storage 2 Source area number: 37
The Source Area is directly connected or draining to a directly conntected area

Commercial Areas
Roofs 1 Source area number: 61
The roof is flat
The Source Area is directly connected or draining to a directly conntected area
Paved Parking/Storage 1 Source area number: 66
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 1 Source area number: 76
The Source Area is directly connected or draining to a directly conntected area
Street Area 1 Source area number: 78
1. Street Texture: smooth
2. Total study area street length (curb-miles): .56
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/91 Schedule: 1 Pass/week (Wed)
Final cleaning period ending date: 11/15/91
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .45
6. Equation coefficient B (intercept): 125
Street Area 2 Source area number: 79
1. Street Texture: intermediate

2. Total study area street length (curb-miles): .36
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
   Default value used

Control Practice: Street Cleaning
1. Street cleaning schedule:
   Begin cleaning on: 04/01/91 Schedule: Every 4 weeks (Wed)
   Final cleaning period ending date: 11/15/91
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450

Catchbasin or Drainage Controls

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

Data file name: SYENE00.DAT
Rain file name: SYEN91V2.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 04/01/91
Date: 11-30-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW.POL

Study period ending date: 07/09/91
Time: 14:27:09

Fraction of each type of Drainage System serving study area:
1. Grass Swales 0
2. Undeveloped roadside 0
Curb and Gutters, 'valleys', or sealed swales in:
3. Poor condition (or very flat) 0
4. Fair condition .25
5. Good condition (or very steep) .75

Site information: SYENE7.DAT W/ STREET 2 SMOOTH INSTEAD OF INTERMEDIATE

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	0.00	0.00	0.00	6.91	0.00
Roofs 2	0.00	0.00	0.00	0.70	0.00
Roofs 3	0.00	0.00	0.00	10.41	0.00
Roofs 4	0.00	0.00	0.00	6.10	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	30.84	0.00
Paved Parking/Storage	0.00	0.00	0.00	2.46	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	4.53	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	0.00	0.00	0.00	0.70	0.00
Driveways 2	0.00	0.00	0.00	0.08	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 2	0.00	0.00	0.00	0.00	0.00
Street Area 1	0.00	0.00	0.00	1.33	0.00
Street Area 2	0.00	0.00	0.00	1.23	0.00
Street Area 3	0.00	0.00	0.00	6.09	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 1	0.00	0.00	0.00	22.17	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	22.17	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.00	0.00	0.00	0.00	0.00
Other Pervious Area	0.00	0.00	0.00	0.00	0.00
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	115.72	0.00

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 115.72

Total of All Source Areas less All Isolated Areas 115.72

Source Area Control Practice Information

Industrial Areas

Roofs 1 Source area number: 91
The roof is flat
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 92
The roof is flat
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

Roofs 3 Source area number: 93
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 4 Source area number: 94
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present

DYGNE49.PM1

Paved Parking/Storage 1   Source area number: 96
    The Source Area is directly connected or draining to a directly conntected area
Paved Parking/Storage 2   Source area number: 97
    The Source Area is draining to a pervious area (partially connected impervious area)
    The SCS Hydrologic Soil Type is C/D
    The building density is medium or high
    Alleys are not present
Unpaved Parking/Storage 1   Source area number: 99
    The Source Area is draining to a pervious area (partially connected impervious area)
    The SCS Hydrologic Soil Type is C/D
    The building density is medium or high
    Alleys are not present
Driveways 1   Source area number: 103
    The Source Area is directly connected or draining to a directly conntected area
Driveways 2   Source area number: 104
    The Source Area is draining to a pervious area (partially connected impervious area)
    The SCS Hydrologic Soil Type is C/D
    The building density is medium or high
    Alleys are not present
Street Area 1   Source area number: 108
    1. Street Texture: intermediate
    2. Total study area street length (curb-miles): .5
    3. Initial Street Dirt Loading (lbs/curb-mi): default value
    4. Street Dirt Accumulation:
        Default value used
  Control Practice: Street Cleaning
    1. Street cleaning schedule:
        Begin cleaning on: 04/01/91   Schedule: Every 2 weeks (Wed)
        Final cleaning period ending date: 11/15/91
    2. Street cleaner productivity: Default
    3. Parking density: Light
    4. Parking controls imposed? No
    5. Equation coefficient M (slope):   .3
    6. Equation coefficient B (intercept):   450
Street Area 2   Source area number: 109
    1. Street Texture: smooth
    2. Total study area street length (curb-miles): .5
    3. Initial Street Dirt Loading (lbs/curb-mi): default value
    4. Street Dirt Accumulation:
        Default value used
  Control Practice: Street Cleaning
    1. Street cleaning schedule:
        Begin cleaning on: 04/01/91   Schedule: Every 2 weeks (Wed)
        Final cleaning period ending date: 11/15/91
    2. Street cleaner productivity: Default
    3. Parking density: Light
    4. Parking controls imposed? No
    5. Equation coefficient M (slope):   .27
    6. Equation coefficient B (intercept):   170
Street Area 3   Source area number: 110
    1. Street Texture: smooth
    2. Total study area street length (curb-miles): 2.95
    3. Initial Street Dirt Loading (lbs/curb-mi): default value
    4. Street Dirt Accumulation:
        Default value used
  Control Practice: Street Cleaning
    1. Street cleaning schedule:
        Begin cleaning on: 04/15/91   Schedule: Every 2 weeks (Wed)
        Final cleaning period ending date: 11/15/91
    2. Street cleaner productivity: Default
    3. Parking density: Light
    4. Parking controls imposed? No
    5. Equation coefficient M (slope):   .27
    6. Equation coefficient B (intercept):   170
Smll Lndscpd Area 1   Source area number: 114
    The SCS Hydrologic Soil Type is A/B
Smll Lndscpd Area 2   Source area number: 115
    The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

A2

Parameter Files

Runoff Coefficient file name: MILW00.RSV
Runoff Coefficient file description: CALIBRATED 12/6/91 FROM MILWAUKEE AND MADISON DATA
Date: 12-06-1991

Area Types:
1: Connected flat roofs
2: Connected Pitched Roofs
3: Directly connected impervious areas
4: Directly connected unpaved areas
5: Pervious areas - A/B soils
6: Pervious areas - C/D soils
7: Smooth textured streets
8: Intermediate textured streets
9: Rough textured streets

Drainage efficiency coefficients (fractions)
10: C/D soils, w/o alleys, medium to high density land use
11: C/D soils, w/ alleys, medium to high density land use
12: C/D soils for strip commercial and shopping center land use

Volumetric Runoff Coefficients for Rains (in & mm)

Area Type No																		
	in:	.04	.08	.12	.20	.39	.59	.79	.98	1.2	1.6	2.0	2.4	2.8	3.2	3.5	3.9	4.9
	mm:	1	2	3	5	10	15	20	25	30	40	50	60	70	80	90	100	125
	Rain #:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 :		.00	.15	.45	.64	.77	.79	.83	.84	.86	.88	.90	.91	.93	.94	.94	.95	.96
2 :		.25	.63	.75	.85	.93	.95	.96	.97	.98	.98	.99	.99	.99	.99	.99	.99	.99
3 :		.50	.72	.75	.82	.90	.92	.93	.93	.94	.94	.95	.96	.96	.96	.96	.96	.96
4 :		.00	.00	.00	.00	.47	.64	.72	.77	.81	.86	.89	.91	.92	.93	.94	.94	.95
5 :		.00	.00	.00	.00	.01	.02	.02	.02	.03	.04	.07	.10	.13	.15	.20	.22	.25
6 :		.00	.00	.00	.10	.15	.19	.20	.21	.22	.23	.26	.29	.32	.33	.36	.39	.45
7 :		.35	.49	.54	.59	.65	.69	.72	.76	.80	.85	.88	.90	.91	.93	.93	.94	.95
8 :		.26	.43	.49	.55	.60	.64	.67	.70	.73	.80	.84	.86	.88	.90	.91	.92	.93
9 :		.18	.39	.47	.53	.60	.64	.67	.70	.73	.80	.84	.86	.88	.90	.91	.92	.93

Drainage efficiency coefficients (fractions):

10 :	.00	.00	.00	.11	.16	.20	.21	.22	.22	.24	.27	.30	.33	.34	.37	.40	.46
11 :	.00	.05	.12	.22	.53	.73	.85	.92	.96	.99	%1.00	%1.00	%1.00	%1.00	%1.00	%1.00	%1.00
12 :	.00	.00	.00	.47	.90	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99

Particulate Solids Concentration file name: MILW00.PSC
Particulate Solids Concentration file description: CALIBRATED 12/6/91 FROM MILWAUKEE AND MADISON DATA
Date: 12-06-1991

Area Types:
A : Roofs
B : Paved Parking
C : Unpaved parking, driveways, and walkways
D : Paved playgrounds
E : Paved driveways
F : Paved sidewalks and walks
G : Large landscaped areas
H : Small landscaped areas
I : Undeveloped areas
J : Other pervious areas
K : Other directly connected impervious areas
L : Other partially connected impervious areas
M : Paved lane and shoulder areas

Row No	Area Type	Particulate Residue (mg/l) for Rains (in & mm)														
		.04	.08	.12	.20	.39	.59	.79	.98	1.2	1.6	2.0	2.4	2.8	3.2	:in
		1	2	3	5	10	15	20	25	30	40	50	60	70	80	:mm
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	:Rain #
Residential Areas																
1	A	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
2	B	991	528	357	201	77	57	57	57	57	57	57	57	57	57	
3	C	440	440	440	440	440	440	377	377	377	377	377	377	377	377	
4	D	126	126	126	126	77	57	57	57	57	57	57	57	57	57	
5	E	276	276	276	201	77	57	57	57	57	57	57	57	57	57	
6	F	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
7	G	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
8	H	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
9	I	250	250	250	250	250	250	250	250	250	250	250	250	250	250	
10	J	158	158	158	158	158	158	158	158	158	158	158	158	158	158	
11	K	991	528	357	201	77	57	57	57	57	57	57	57	57	57	
12	L	991	528	357	201	77	57	57	57	57	57	57	57	57	57	
Institutional Areas																
13	A	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
14	B	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
15	C	800	800	800	800	800	700	600	600	600	600	600	600	600	600	
16	D	1581	844	568	322	123	92	92	92	92	92	92	92	92	92	
17	E	400	400	400	322	123	92	92	92	92	92	92	92	92	92	
18	F	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
19	G	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
20	H	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
21	I	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
22	J	250	250	250	250	250	250	250	250	250	250	250	250	250	250	
23	K	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
24	L	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
Commercial Areas																
25	A	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
26	B	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
27	C	6000	6000	5000	3000	2000	1000	700	600	600	600	600	600	600	600	
28	D	1581	844	568	322	123	92	92	92	92	92	92	92	92	92	
29	E	400	400	400	322	123	92	92	92	92	92	92	92	92	92	
30	F	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
31	G	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
32	H	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
33	I	5000	4000	3300	2200	1100	700	600	600	600	600	600	600	600	600	
34	J	250	250	250	250	250	250	250	250	250	250	250	250	250	250	
35	K	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
36	L	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
Industrial Areas																
37	A	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
38	B	1630	870	586	332	127	95	95	95	95	95	95	95	95	95	
39	C	3000	3000	2500	1500	1000	500	350	300	300	300	300	300	300	300	
40	D	300	200	150	100	100	100	100	100	100	100	100	100	100	100	
41	E	300	200	150	100	100	100	100	100	100	100	100	100	100	100	
42	F	300	200	150	100	100	100	100	100	100	100	100	100	100	100	
43	G	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
44	H	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
45	I	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
46	J	250	250	250	250	250	250	250	250	250	250	250	250	250	250	
47	K	300	200	150	100	100	100	100	100	100	100	100	100	100	100	
48	L	300	200	150	100	100	100	100	100	100	100	100	100	100	100	

Open Space Areas															
49	A	5	5	5	5	5	5	5	5	5	5	5	5	5	5
50	B	1630	870	586	332	127	95	95	95	95	95	95	95	95	95
51	C	2500	2500	2500	2200	1100	700	600	600	600	600	600	600	600	600
52	D	1581	844	568	322	123	92	92	92	92	92	92	92	92	92
53	E	400	400	400	322	123	92	92	92	92	92	92	92	92	92
54	F	50	50	50	50	50	50	50	50	50	50	50	50	50	50
55	G	300	300	300	300	300	300	300	300	300	300	300	300	300	300
56	H	300	300	300	300	300	300	300	300	300	300	300	300	300	300
57	I	500	500	500	500	500	500	500	500	500	500	500	500	500	500
58	J	250	250	250	250	250	250	250	250	250	250	250	250	250	250
59	K	1630	870	586	332	127	95	95	95	95	95	95	95	95	95
60	L	1630	870	586	332	127	95	95	95	95	95	95	95	95	95
Freeways															
61	M	200	200	200	200	200	200	200	200	200	200	200	200	200	200
62	G	300	300	300	300	300	300	300	300	300	300	300	300	300	300
63	I	500	500	500	500	500	500	500	500	500	500	500	500	500	500
64	J	250	250	250	250	250	250	250	250	250	250	250	250	250	250
65	K	1630	870	586	332	127	95	95	95	95	95	95	95	95	95
66	L	1630	870	586	332	127	95	95	95	95	95	95	95	95	95

Particulate Residue Reduction due to Delivery file name: MILWOO.PRR
Size distribution file description: CALIBRATED 12/6/91 FROM MADISON AND MILWAUKEE DATA
Date: 12-06-1991

Particulate Residue Reduction due to Delivery (fraction) for Rains (in & mm)

	Rain (in) :	.04	.08	.12	.20	.39	.59	.79	.98	1.2	1.6	2.0	2.4	2.8	3.2
	Rain (mm) :	1	2	3	5	10	15	20	25	30	40	50	60	70	80
For 1.	Grass Swales:	0.99	0.98	0.97	0.94	0.85	0.74	0.61	0.44	0.25	0.07	0.02	0.00	0.00	0.00
For 2.	Undeveloped roadside:	0.99	0.98	0.97	0.94	0.85	0.74	0.61	0.44	0.25	0.07	0.02	0.00	0.00	0.00
For 3.	Curb and Gutters, 'valleys', or sealed swales in poor condition (or very flat):	0.98	0.96	0.92	0.85	0.61	0.46	0.31	0.22	0.13	0.04	0.01	0.00	0.00	0.00
For 3.	Curb and Gutters, 'valleys', or sealed swales in fair condition:	0.98	0.95	0.90	0.80	0.48	0.32	0.16	0.11	0.07	0.02	0.00	0.00	0.00	0.00
For 3.	Curb and Gutters, 'valleys', or sealed swales in good condition (or very steep):	0.20	0.14	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pollutant Relative Concentration file name: MILW00.POL
File description: CALIBRATED 12/6/91 FROM MILWAUKEE AND MADISON DATA
Date: 12-06-1991

Source Areas:

1: Roofs
2: Paved Parking/Storage
3: Unpaved Parking/Storage
4: Playground
5: Driveways
6: Sidewalks/Walks
7: Street Area
8: Large Landscaped Area
9: Undeveloped Area
10: Small Landscaped Area
11: Isolated Area
12: Other Pervious Area
13: Other Dir Conctd Imperv Area
14: Othr Partially Conctd Imperv Area
15: Paved Lane & Shoulder Area
16: Large Turf Areas

	Land Uses					
Source Area #	Resident-ial Areas	Institut-ional Areas	Commercial Areas	Industrial Areas	Open Spaces	Freeways
Particulate Pollutant:	Phosphorus (mg/kg)					
1 :	1600	1000	1000	1600	1600	0
2 :	580	2960	2960	580	580	0
3 :	570	570	570	570	570	0
4 :	500	500	500	500	500	0
5 :	580	580	580	580	580	0
6 :	995	995	995	995	995	0
7 :	650	650	940	670	650	0
8 :	2800	2800	2800	2800	2800	0
9 :	695	695	695	695	695	695
10 :	1250	1250	1250	1250	1250	0
11 :	0	0	0	0	0	0
12 :	1600	1600	1600	1600	1600	1600
13 :	500	500	500	500	500	500
14 :	500	500	500	500	500	500
15 :	0	0	0	0	0	1000
16 :	0	0	0	0	0	2800
Particulate Pollutant:	Chemical Oxygen Demand (mg/kg)					
1 :	913000	1520000	1520000	963000	913000	0
2 :	512000	512000	1470000	540000	512000	0
3 :	695000	695000	695000	733000	695000	0
4 :	507000	507000	507000	535000	507000	0
5 :	512000	507000	507000	535000	507000	0
6 :	664000	659000	659000	701000	659000	0
7 :	304000	304000	1170000	428000	304000	0
8 :	1115000	1115000	1115000	1180000	1115000	0
9 :	276000	276000	276000	292000	276000	284000
10 :	507000	507000	507000	535000	507000	0
11 :	0	0	0	0	0	0
12 :	761000	761000	761000	803000	761000	782000
13 :	304000	304000	304000	321000	304000	313000
14 :	304000	304000	304000	321000	304000	313000
15 :	0	0	0	0	0	464000
16 :	0	0	0	0	0	1150000
Particulate Pollutant:	Copper (mg/kg)					
1 :	51	121	121	104	106	0
2 :	87	87	87	60	139	0
3 :	151	151	151	60	151	0
4 :	82	82	82	249	82	0
5 :	38	139	139	35	139	0
6 :	38	131	38	398	131	0
7 :	20	375	70	58	375	0
8 :	16	41	41	16	41	0
9 :	73	73	73	224	73	150
10 :	16	16	16	16	16	0
11 :	0	0	0	0	0	0
12 :	16	41	41	125	41	82
13 :	82	82	82	249	82	165
14 :	82	82	82	249	82	165
15 :	0	0	0	0	0	1100
16 :	0	0	0	0	0	150
Particulate Pollutant:	Lead (mg/kg)					
1 :	894	268	268	884	894	0
2 :	670	2240	2240	663	670	0
3 :	429	429	429	424	429	0
4 :	447	447	447	442	447	0
5 :	671	671	671	663	671	0
6 :	742	742	742	734	742	0
7 :	740	983	3580	796	983	0
8 :	241	241	241	239	271	0
9 :	121	121	121	119	121	121
10 :	45	45	45	45	45	0

*

11 :	0	0	0	0	0	0
12 :	134	134	134	134	134	134
13 :	447	447	447	447	447	447
14 :	447	447	447	447	447	447
15 :	0	0	0	0	0	8630
16 :	0	0	0	0	0	240
Particulate Pollutant:	Zinc (mg/kg)					
1 :	983	983	894	2860	983	0
2 :	420	1070	1070	2340	420	0
3 :	264	264	264	767	264	0
4 :	268	268	268	780	268	0
5 :	420	420	420	1200	420	0
6 :	773	773	773	2250	773	0
7 :	384	447	876	1300	384	0
8 :	179	179	179	520	179	0
9 :	237	237	237	689	237	450
10 :	103	103	103	300	103	0
11 :	0	0	0	0	0	0
12 :	179	179	179	520	179	340
13 :	268	268	268	780	268	510
14 :	268	268	268	780	268	510
15 :	0	0	0	0	0	1730
16 :	0	0	0	0	0	450
Filterable Pollutant:	Filterable Residue (mg/L)					
1 :	116	386	386	148	116	0
2 :	223	223	223	157	223	0
3 :	1240	1240	1240	585	1240	0
4 :	223	223	223	105	223	0
5 :	223	223	223	105	223	0
6 :	318	318	318	150	318	0
7 :	151	151	247	263	151	0
8 :	861	861	861	406	861	0
9 :	846	846	846	400	846	627
10 :	861	861	861	406	861	0
11 :	0	0	0	0	0	0
12 :	861	861	861	406	861	638
13 :	223	223	223	105	223	165
14 :	223	223	223	105	223	165
15 :	0	0	0	0	0	352
16 :	0	0	0	0	0	638
Filterable Pollutant:	Phosphorus (ìg/L)					
1 :	40	40	40	40	40	0
2 :	340	340	130	1000	340	0
3 :	40	40	40	40	40	0
4 :	100	100	100	100	100	0
5 :	100	100	100	100	100	0
6 :	600	600	600	600	600	0
7 :	390	390	410	470	390	0
8 :	220	220	220	220	220	0
9 :	250	250	250	250	250	250
10 :	220	220	220	220	220	0
11 :	0	0	0	0	0	0
12 :	220	220	220	220	220	220
13 :	100	100	100	100	100	100
14 :	100	100	100	100	100	100
15 :	0	0	0	0	0	400
16 :	0	0	0	0	0	220
Filterable Pollutant:	Chemical Oxygen Demand (mg/L)					
1 :	23	84	84	38	23	0
2 :	22	22	55	52	22	0
3 :	107	107	107	113	107	0
4 :	17	17	17	17	17	0
5 :	22	22	22	22	22	0
6 :	22	22	22	22	22	0
7 :	40	40	101	191	40	0
8 :	17	17	17	17	17	0
9 :	20	20	20	20	20	20
10 :	17	17	17	17	17	0
11 :	0	0	0	0	0	0
12 :	17	17	17	17	17	17
13 :	22	22	22	22	22	22
14 :	22	22	22	22	22	22
15 :	0	0	0	0	0	78
16 :	0	0	0	0	0	18
Filterable Pollutant:	Fecal Coliform Bact. (#/100 ml)					
1 :	5030	80	80	5010	5030	0
2 :	100000	100000	48000	9800	100000	0
3 :	200000	200000	200000	200000	200000	0
4 :	18000	18000	18000	18000	18000	0
5 :	300000	300000	300000	300000	300000	0

6 :	170000	170000	170000	170000	170000	0
7 :	43000	43000	43000	170000	43000	0
8 :	30000	30000	30000	30000	30000	0
9 :	30000	30000	30000	30000	30000	30000
10 :	30000	30000	30000	30000	30000	0
11 :	0	0	0	0	0	0
12 :	30000	30000	30000	30000	30000	30000
13 :	18000	18000	18000	18000	18000	18000
14 :	18000	18000	18000	18000	18000	18000
15 :	0	0	0	0	0	43000
16 :	0	0	0	0	0	30000

Filterable Pollutant: Copper (Ìg/L)

1 :	3	6	6	2	16	0
2 :	4	4	4	15	0	0
3 :	47	47	47	15	47	0
4 :	0	0	0	0	0	0
5 :	4	0	0	9	0	0
6 :	4	16	4	50	16	0
7 :	4	0	8	18	0	0
8 :	6	0	0	6	0	0
9 :	0	0	0	0	0	0
10 :	3	0	0	6	0	0
11 :	0	0	0	0	0	0
12 :	3	0	0	0	0	0
13 :	7	0	0	0	0	0
14 :	0	0	0	0	0	0
15 :	0	0	0	0	0	0
16 :	0	0	0	0	0	0

Filterable Pollutant: Lead (Ìg/L)

1 :	20	20	20	2	20	0
2 :	0	0	31	0	0	0
3 :	0	0	0	0	0	0
4 :	0	0	0	0	0	0
5 :	0	0	0	0	0	0
6 :	33	33	33	4	33	0
7 :	4	4	21	12	4	0
8 :	3	3	3	0	3	0
9 :	4	4	4	0	4	2
10 :	3	3	3	0	3	0
11 :	0	0	0	0	0	0
12 :	3	3	3	0	3	2
13 :	0	0	0	0	0	0
14 :	0	0	0	0	0	0
15 :	0	0	0	0	0	130
16 :	0	0	0	0	0	2

Filterable Pollutant: Zinc (Ìg/L)

1 :	268	165	165	35	268	0
2 :	134	134	122	110	134	0
3 :	134	134	134	87	134	0
4 :	27	27	27	17	27	0
5 :	134	134	134	87	134	0
6 :	27	27	27	17	27	0
7 :	72	72	97	237	72	0
8 :	3	3	3	2	3	0
9 :	22	22	22	14	22	19
10 :	3	3	3	2	3	0
11 :	0	0	0	0	0	0
12 :	3	3	3	2	3	2
13 :	27	27	27	17	27	22
14 :	27	27	27	17	27	22
15 :	0	0	0	0	0	204
16 :	0	0	0	0	0	2

Filterable Pollutant: Other 1 Pseudo. aerug. (#/100 ml)

1 :	18300	610	610	225	610	0
2 :	610	610	610	26100	610	0
3 :	6100	6100	6100	63000	6100	0
4 :	610	610	610	610	610	0
5 :	367	610	610	64350	610	0
6 :	610	610	610	16200	610	0
7 :	348	348	367	27900	348	0
8 :	1280	1280	1280	9450	1280	0
9 :	1280	1280	1280	9450	1280	5460
10 :	1280	1280	1280	9450	1280	0
11 :	0	0	0	0	0	0
12 :	1280	1280	1280	9450	1280	5460
13 :	610	610	610	4500	611	2600
14 :	610	610	610	4500	611	2600
15 :	0	0	0	0	0	1560
16 :	0	0	0	0	0	5460

Appendix B

Calibration Results

B1 - Description of Tables and Graphs
B2 - Post Office Study Area Results
B3 - Rustler Study Area Results
B4 - Hastings 1980-1982 Study Area Results
B5 - Burbank Study Area Results
B6 - State Fair Study Area Results
B7 - Wood Center 1980-1982 Study Area Results
B8 - Hastings 1990 Study Area Results
B9 - Wood Center 1990 Study Area Results
B10 - Monroe Street Study Area Results
B11 - Syene Road Study Area Results

B1

Description of Tables and Graphs

B1

DESCRIPTION OF TABLES AND GRAPHS

The following sections of this Appendix describe the results of the SLAMM model calibration for the ten runoff and suspended solids calibration data sets and the two copper calibration data sets. Each section contains the following information:

- A calibration result summary table.
- A spreadsheet presenting storm runoff data.
- Runoff calibration plots.
- A spreadsheet presenting suspended solids data.
- Suspended solids calibration plots.
- Copper data spreadsheets and plots (Monroe Street and Syene Road only).

The calibration results summary tables list descriptive statistics for both the runoff and the suspended solids results with delivery. The statistics listed on each table include the mean, the standard deviation, the coefficient of variation, the sum, and the count (number of storm data). The coefficient of variation (COV) (standard deviation divided by the mean) is a measure of the variation or "spread" of the data, and is used to compare the relative scatter of the observed data and the predicted data.

The detailed runoff data spreadsheet lists the observed and predicted runoff and RV values for each event in the data set. The RV is the runoff coefficient, which is defined as the event runoff divided by the event rainfall. The residual (observed value less predicted value) for each value is also listed in these tables. The data summary at the bottom of each table includes the maximum value, the minimum value, the count, the average, the standard deviation, the coefficient of variation, and the sum of the values. Following the spreadsheet, three runoff scatterplots are presented, illustrating the observed runoff vs. the predicted runoff, the predicted runoff vs. the runoff residual, and the rain depth vs. the runoff residual for each event.

The detailed suspended solids data spreadsheet lists the observed value, the predicted value without and with the reduction due to delivery at the outfall, and the residual value without and with the reduction due to delivery at the outfall for each event in the data set. An asterisk next to a data value in the suspended solids tables indicates that the value was selected as an outlier. The data summary at the end of each table includes the maximum value, the minimum value, the count, the average, the standard deviation, the coefficient of variation, and the sum of the observed, predicted, and residual values, and also includes the sums and residuals of the total values less the indicated outliers. Three scatterplots following the suspended solids spreadsheet illustrate the observed suspended solids vs. the predicted suspended solids, predicted suspended solids vs. the suspended solids residual, and the rain depth vs. the suspended solids residual for each event.

The copper calibration results presented for the Monroe Street and Syene Road sites present event-by-event results for the outfall from each study area. The spreadsheet lists observed and predicted data for total, dissolved, and particulate copper at the outfall, followed by a scatterplot showing predicted vs. observed total copper loading values. Summary statistics are the same as for runoff and suspended solids, but also include the geometric mean of each form of copper.

[mad-603-34y]

B2

Post Office Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: POSTØØ.DAT

Post Office	Observed	Predicted	Residuals
Runoff [in]			
Average	0.52	0.53	-0.01
Std Dev	0.53	0.56	—
COV	1.03	1.07	—
Sum	40.83	41.56	-0.73
Count	79		
Runoff - outliers [in]			
Average	0.51	0.52	-0.01
Std Dev	0.54	0.56	—
COV	1.05	1.08	—
Sum	39.99	40.75	-0.76
Count	78		
Rv			
Average	0.87	0.85	0.02
Std Dev	0.12	0.13	—
COV	0.14	0.15	-
SS w/Delivery [lbs]			
Average	128	114	14
Std Dev	195	145	—
COV	1.53	1.28	—
Sum	10096	9001	1095
Count	79		
SS w/Delivery - outliers [lbs]			
Average	113	113	0
Std Dev	145	146	—
COV	1.28	1.29	—
Sum	8808	8827	-19
Count	78		

filename: DATASUM.WK1

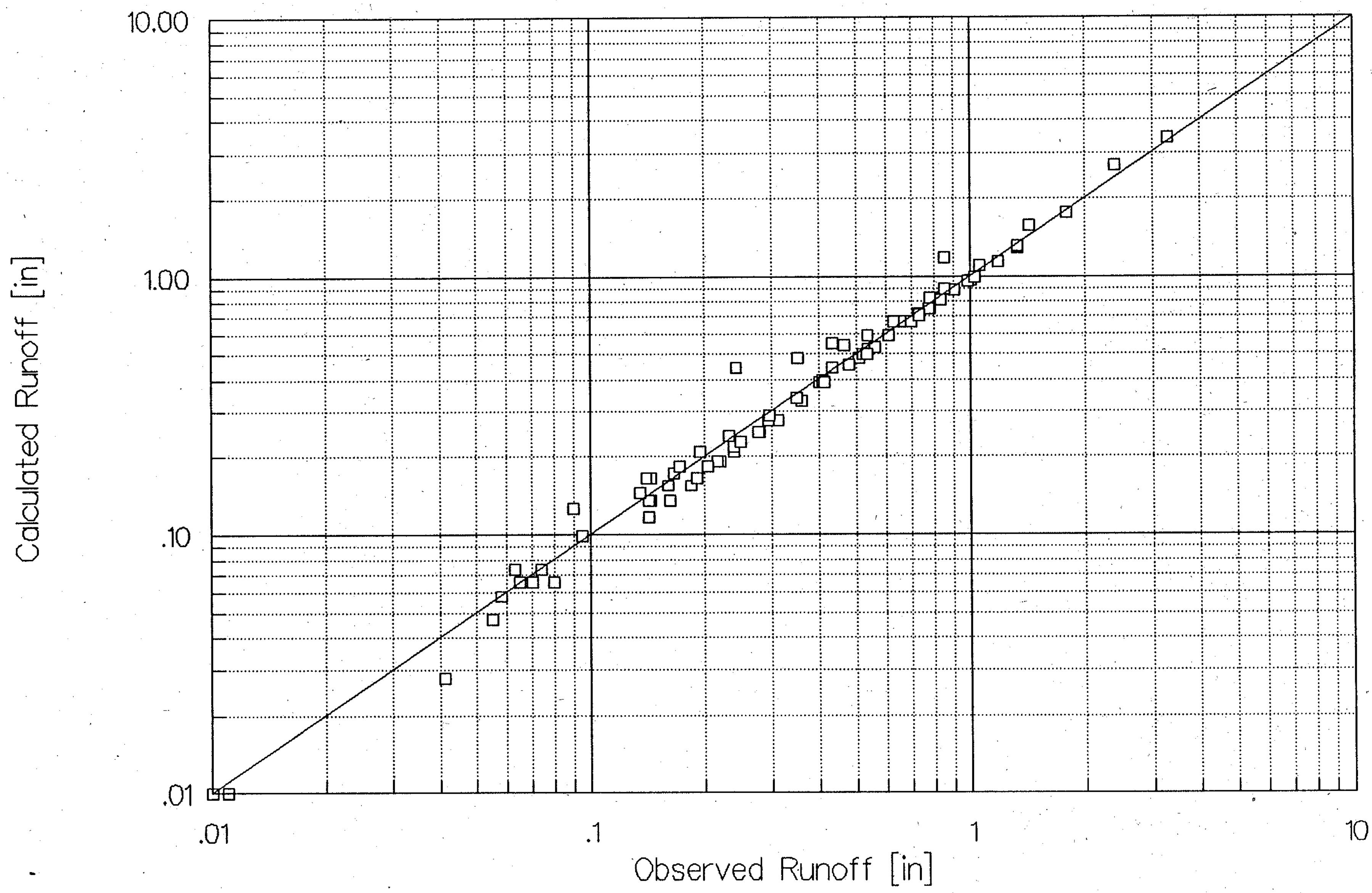
JGV/RTB

10 POST00.CAL; w/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Row	A Code #	B DATE	C RAIN (in)	D Obsrvd Runoff (in)	E Obsrvd Runoff (cu ft)	F Calc Runoff [in]	G Resid Runoff [in]	H Calc Runoff (cu ft)	I Obsrvd Resid Runoff [cu ft]	J Calc Res % of Obsrvd	K Obsrvd RV (in/in)	L Calc RV (in/in)	M Resid Rv
15	267	4/ 3/80	.23	.22	9663	.192	.0283	8420	1243	.13	.96	.83	.13
16	269	4/ 6/80	.10	.07	3250	.074	.0004	3234	16	.01	.74	.74	.00
17	270	4/ 8/80	.43	.40	17657	.389	.0134	17068	589	.03	.93	.90	.03
18	271	4/ 9/80	.32	.31	13704	.278	.0336	12229	1475	.11	.98	.87	.11
19	272	4/14/80	.19	.18	8082	.155	.0294	6792	1290	.16	.97	.81	.16
20	273	4/28/80	.10	.06	2767	.074	-.0106	3234	-467	-.17	.63	.74	-.11
21	274	4/28/80	.80	.78	34304	.744	.0370	32679	1625	.05	.98	.93	.05
22	275	5/13/80	.21	.17	7291	.173	-.0073	7613	-322	-.04	.79	.83	-.04
23	277	6/ 1/80	.29	.28	12255	.249	.0302	10927	1328	.11	.96	.86	.10
24	278	6/ 2/80	.25	.24	10542	.210	.0296	9241	1301	.12	.96	.84	.12
25	279	6/ 5/80	.89	.83	36412	.828	.0013	36355	57	.00	.93	.93	.00
26	280	6/ 6/80	.72	.63	27452	.667	-.0421	29303	-1851	-.07	.87	.93	-.06
27	281	6/ 7/80	.60	.43	19063	.552	-.1183	24258	-5195	-.27	.72	.92	-.20
28	282	6/19/80	.09	.07	2855	.066	-.0006	2880	-25	-.01	.72	.73	-.01
29	283	7/16/80	1.04	1.00	43967	.970	.0308	42612	1355	.03	.96	.93	.03
30	284	8/ 2/80	.26	.24	10498	.220	.0191	9657	841	.08	.92	.85	.07
31	285	8/ 2/80	.25	.19	8521	.210	-.0164	9241	-720	-.08	.78	.84	-.06
32	286	8/ 4/80	2.79	2.39	104888	2.678	-.2904	117643	-12755	-.12	.86	.96	-.10
33	287	8/ 7/80	.95	.91	39750	.884	.0215	38806	944	.02	.95	.93	.02
34	288	8/11/80	.57	.54	23543	.523	.0128	22981	562	.02	.94	.92	.02
35	289	8/13/80	.05	.04	1801	.028	.0130	1229	572	.32	.82	.56	.26
36	290	8/19/80	.58	.56	24597	.533	.0270	23410	1187	.05	.97	.92	.05
37	292	9/ 9/80	1.26	.85	37422	1.184	-.3324	52022	-14600	-.39	.68	.94	-.26
38	293	9/12/80	1.37	1.33	58330	1.288	.0402	56564	1766	.03	.97	.94	.03
39	294	9/16/80	.77	.73	31932	.715	.0116	31423	509	.02	.94	.93	.01
40	295	9/20/80	.72	.67	29384	.667	.0019	29303	81	.00	.93	.93	.00
41	296	9/25/80	.09	.07	3075	.066	.0044	2880	195	.06	.78	.73	.05
42	297	10/ 2/80	.02	.01	483	.005	.0059	223	260	.54	.55	.25	.30
43	298	10/16/80	.15	.14	6237	.117	.0253	5128	1109	.18	.95	.78	.17
44	299	10/16/80	.53	.51	22313	.484	.0237	21274	1039	.05	.96	.91	.05
45	300	10/24/80	.20	.19	8389	.164	.0267	7215	1174	.14	.96	.82	.14
46	301	11/13/80	.55	.52	22884	.504	.0173	22126	758	.03	.95	.92	.03
47	302	11/23/80	.17	.16	7116	.135	.0266	5945	1171	.16	.95	.80	.15
48	303	12/ 1/80	.08	.06	2548	.058	.0003	2533	15	.01	.73	.72	.01
49	304	12/ 6/80	.64	.61	26749	.590	.0186	25932	817	.03	.95	.92	.03
50	306	2/22/81	.20	.14	6325	.164	-.0203	7215	-890	-.14	.72	.82	-.10
51	307	4/ 4/81	.87	.83	36632	.809	.0249	35538	1094	.03	.96	.93	.03
52	308	4/ 8/81	.32	.30	12957	.278	.0166	12229	728	.06	.92	.87	.05
53	309	4/ 8/81	.37	.36	15856	.329	.0316	14470	1386	.09	.98	.89	.09
54	310	4/10/81	1.66	1.43	62678	1.564	-.1370	68695	-6017	-.10	.86	.94	-.08
55	311	4/13/81	1.21	1.18	51873	1.137	.0436	49958	1915	.04	.98	.94	.04
56	312	5/29/81	.16	.09	3953	.126	-.0359	5532	-1579	-.40	.56	.79	-.23
57	313	5/29/81	.22	.17	7555	.182	-.0105	8015	-460	-.06	.78	.83	-.05
58	314	6/21/81	.89	.78	34216	.828	-.0487	36355	-2139	-.06	.88	.93	-.05
59	315	7/12/81	1.17	1.05	46251	1.099	-.0462	48278	-2027	-.04	.90	.94	-.04
60	316	7/12/81	.64	.54	23499	.590	-.0554	25932	-2433	-.10	.84	.92	-.08
61	317	7/13/81	3.56	3.29	144507	3.418	-.1276	150111	-5604	-.04	.92	.96	-.04
62	318	7/17/81	.59	.47	20424	.543	-.0778	23840	-3416	-.17	.79	.92	-.13
63	319	7/20/81	.27	.25	10937	.229	.0196	10077	860	.08	.92	.85	.07
64	320	7/27/81	.44	.41	17921	.398	.0099	17484	437	.02	.93	.90	.03
65	321	8/14/81	.72	.70	30526	.667	.0279	29303	1223	.04	.97	.93	.04
66	322	8/15/81	.01	.00	176	.001	.0027	56	120	.68	.40	.13	.27
67	323	8/26/81	1.02	.98	43088	.950	.0305	41747	1341	.03	.96	.93	.03
68	324	8/27/81	.23	.22	9487	.192	.0243	8420	1067	.11	.94	.83	.11
69	325	8/29/81	.19	.16	7028	.155	.0054	6792	236	.03	.84	.81	.03
70	326	8/31/81	1.85	1.79	78403	1.752	.0331	76950	1453	.02	.96	.95	.01
71	327	9/ 8/81	.55	.53	23411	.504	.0293	22126	1285	.05	.97	.92	.05
72	328	9/25/81	.09	.08	3514	.066	.0144	2880	634	.18	.89	.73	.16
73	329	9/26/81	.29	.28	12211	.249	.0292	10927	1284	.11	.96	.86	.10
74	330	9/30/81	1.40	1.33	58505	1.316	.0160	57803	702	.01	.95	.94	.01
75	331	9/30/81	.17	.14	6325	.135	.0086	5945	380	.06	.85	.80	.05
76	332	10/ 6/81	.49	.24	10673	.446	-.2028	19581	-8908	-.83	.50	.91	-.41
77	333	10/14/81	1.06	1.02	44889	.990	.0321	43478	1411	.03	.96	.93	.03
78	334	10/17/81	.81	.78	34040	.753	.0217	33087	953	.03	.96	.93	.03
79	335	4/ 2/82	.28	.23	10190	.239	-.0071	10500	-310	-.03	.83	.85	-.02
80	336	4/ 2/82	.38	.35	15373	.340	.0101	14929	444	.03	.92	.89	.03
81	337	4/ 2/82	.43	.41	18140	.389	.0244	17068	1072	.06	.96	.90	.06
82	338	4/ 3/82	.96	.85	37422	.893	-.0408	39214	-1792	-.05	.89	.93	-.04
83	339	5/11/82	.49	.43	19019	.446	-.0128	19581	-562	-.03	.88	.91	-.03
84	340	5/15/82	.17	.14	6237	.135	.0066	5945	292	.05	.84	.80	.04
85	341	5/21/82	.50	.48	21039	.455	.0236	20003	1036	.05	.96	.91	.05
86	342	5/22/82	.53	.35	15461	.484	-.1323	21274	-5813	-.38	.66	.91	-.25

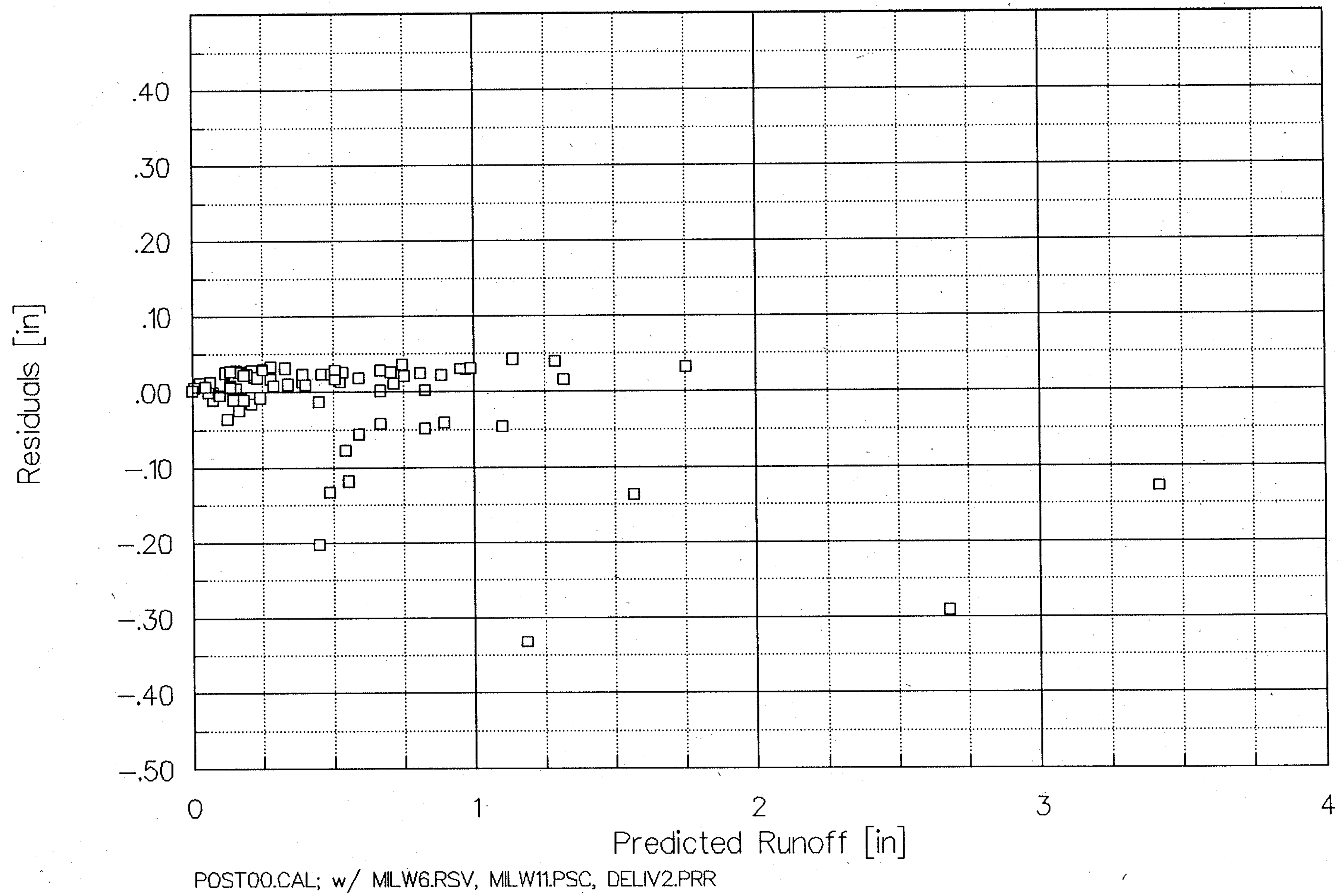
	A	B	C	D	E	F	G	H	I	J	K	L	M
10	POSTOO.CAL; w/ MILW6.RSV, MILW11.PSC, DELIV2.PRR								Obsrvd	Calc	Obsrvd	Calc	
11		DATE	RAIN	Obsrvd	Obsrvd	Calc	Resid	Calc	Resid	Res % of	RV	RV	Resid Rv
12	Code #		(in)	Runoff	Runoff	Runoff	Runoff	Runoff	Runoff	Obsrvd	(in/in)	(in/in)	
13				(in)	(cu ft)	[in]	[in]	(cu ft)	[cu ft]				
14													
87	343	5/26/82	.22	.20	8960	.182	.0215	8015	945	.11	.93	.83	.10
88	344	5/27/82	.20	.14	6149	.164	-.0243	7215	-1066	-.17	.70	.82	-.12
89	345	6/ 7/82	.18	.14	5930	.145	-.0099	6365	-435	-.07	.75	.81	-.06
90	346	6/12/82	.07	.06	2416	.047	.0080	2064	352	.15	.79	.67	.12
91	347	6/15/82	.76	.73	32152	.706	.0263	30998	1154	.04	.96	.93	.03
92	348	6/20/82	.13	.10	4173	.099	-.0039	4343	-170	-.04	.73	.76	-.03
93	349	6/25/82	.33	.30	13045	.288	.0085	12670	375	.03	.90	.87	.03
94								1825388					
95													
96	Minimum :		.01	.00	176	.001	-.332	56	-14600		.40	.13	-.41
97	Maximum :		3.56	3.29	144507	3.418	.044	150111	1915		.98	.96	.30
98	Average :		.57	.52	22700	.526	-.009	23106	-406		.87	.85	.01
99	Count :		79	79	79	79	79	79	79		79	79	79
100	Std.Dev.:		.58	.53	23475	.561	.066	24643	2899		.12	.13	.11
101	Sum :		45.34	40.83	1793288	41.559	-.731	1825388	-32100	-.02			1.16
102	COV :		1.01	1.03	1.03	1.07	-7.13	1.07	-7.13		.14	.15	

Post Office
Observed vs Calc Runoff

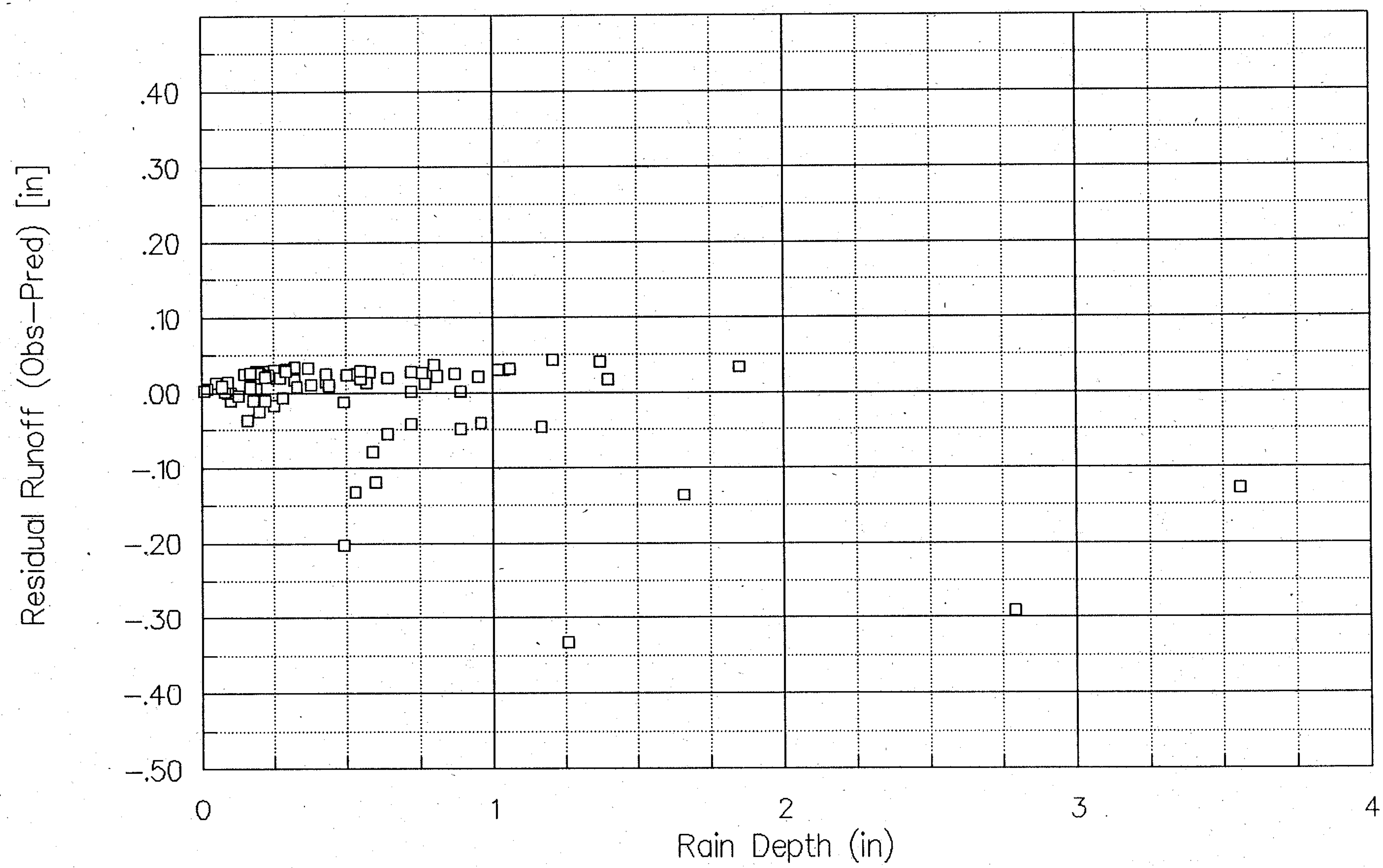


POST00.CAL; w/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Post Office
Total Runoff: Predicted vs Residuals



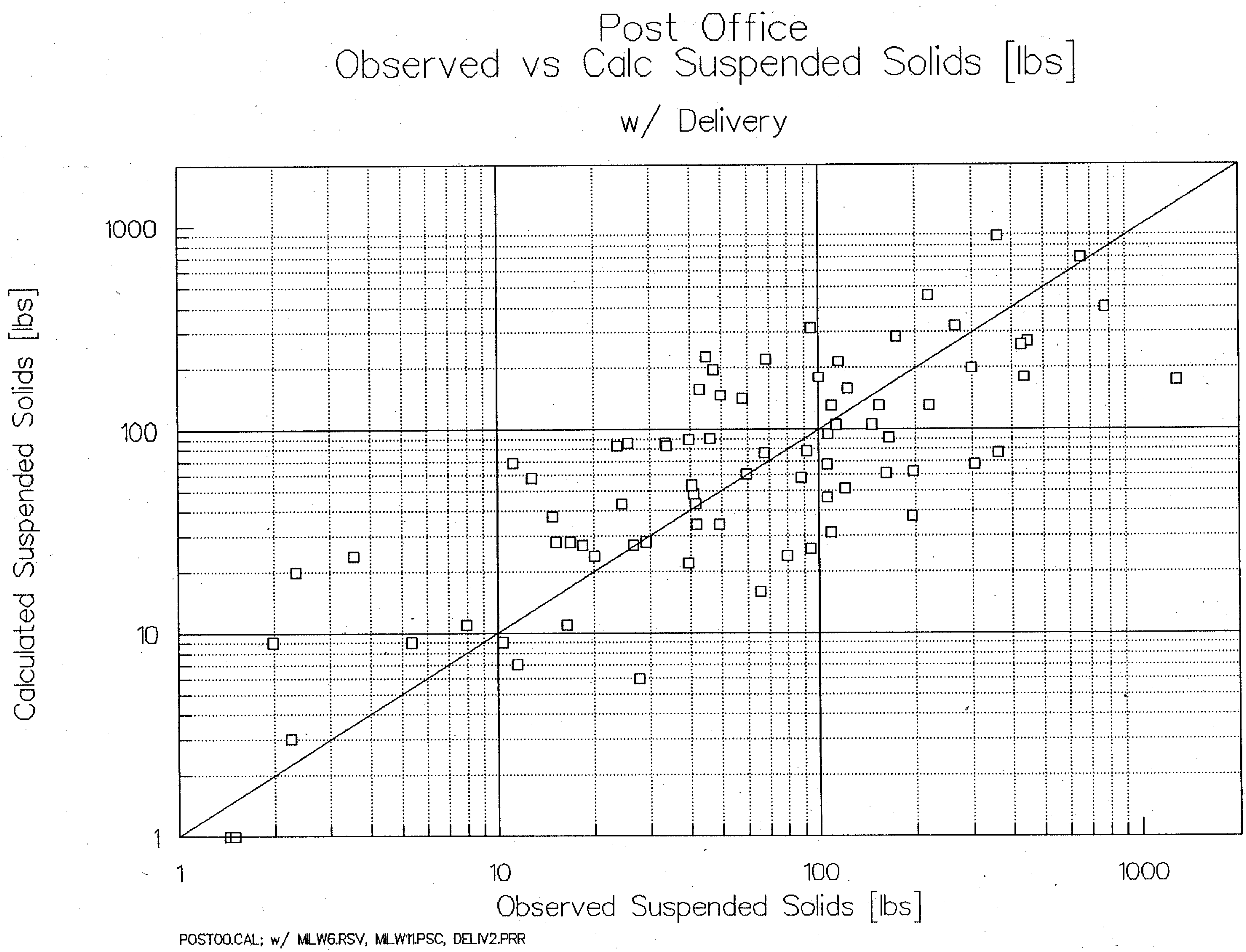
Post Office
Total Runoff: Rain Depth vs Residuals

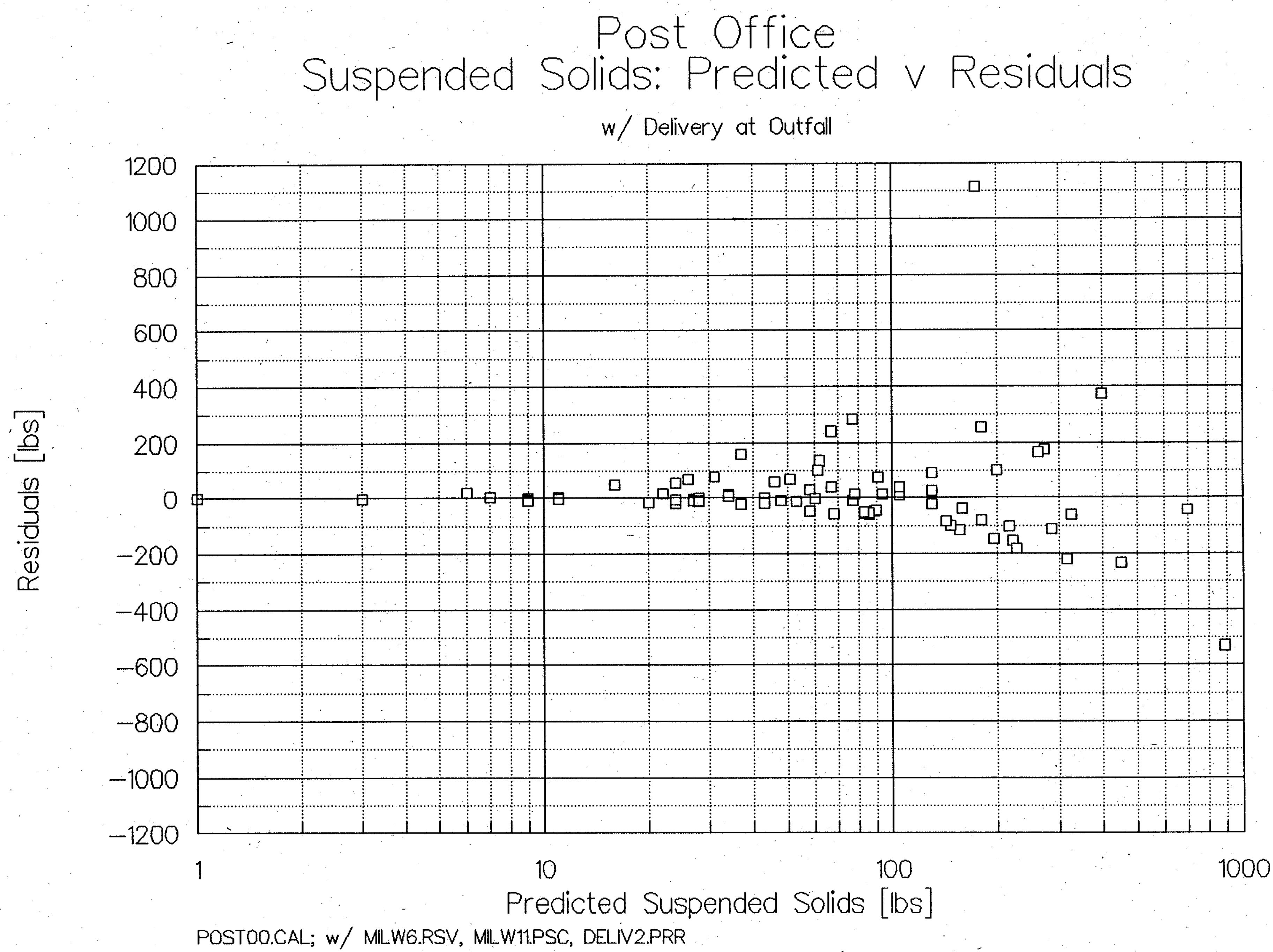


POST00.CAL; w/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

	A	B	C	Y	Z	AA	AB	AC	AD	AE	AF
10	POSTOO.CAL; W/ MILW6.RSV,				SS	SS	SS	SS	SS Resid	SS Resid	Outliers
11		DATE	RAIN		N.FILT.	N.FILT.	Calc w/o	Calc w/	Calc w/o	Calc w/	
12	Code #		(in)		RESID.	RESID.	Delivery	Delivery	Delivery	Delivery	
13					(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]	
14											
15	267	4/ 3/80	.23		324	195	156	37	39	158	
16	269	4/ 6/80	.10		81	16	145	11	-129	5	
17	270	4/ 8/80	.43		278	306	129	67	177	239	
18	271	4/ 9/80	.32		15	13	155	58	-142	-45	
19	272	4/14/80	.19		53	27	150	27	-123	0	
20	273	4/28/80	.10		46	8	145	11	-137	-3	
21	274	4/28/80	.80		20	43	194	156	-151	-113	
22	275	5/13/80	.21		240	109	151	31	-42	78	
23	277	6/ 1/80	.29		53	41	160	53	-119	-12	
24	278	6/ 2/80	.25		63	41	159	43	-118	-2	
25	279	6/ 5/80	.89		192	436	215	180	221	256	
26	280	6/ 6/80	.72		129	221	174	130	47	91	
27	281	6/ 7/80	.60		90	107	144	94	-37	13	
28	282	6/19/80	.09		58	10	142	9	-132	1	
29	283	7/16/80	1.04		25	69	253	222	-184	-153	
30	284	8/ 2/80	.26		162	106	160	46	-54	60	
31	285	8/ 2/80	.25		46	24	159	43	-135	-19	
32	286	8/ 4/80	2.79		100	654	697	697	-43	-43	
33	287	8/ 7/80	.95		19	47	230	196	-183	-149	
34	288	8/11/80	.57		27	40	141	89	-101	-49	
35	289	8/13/80	.05		20	2	109	3	-107	-1	
36	290	8/19/80	.58		30	46	141	90	-95	-44	
37	292	9/ 9/80	1.26		75	175	308	286	-133	-111	
38	293	9/12/80	1.37		26	95	335	316	-240	-221	
39	294	9/16/80	.77		25	50	186	147	-136	-97	
40	295	9/20/80	.72		60	110	174	130	-64	-20	
41	296	9/25/80	.09		28	5	142	9	-137	-4	
42	297	10/ 2/80	.02		48	1	12	0	-11	1	
43	298	10/16/80	.15		6	2	155	20	-153	-18	
44	299	10/16/80	.53		17	24	139	83	-115	-59	
45	300	10/24/80	.20		29	15	148	28	-133	-13	
46	301	11/13/80	.55		18	26	140	86	-114	-60	
47	302	11/23/80	.17		8	4	155	24	-151	-20	
48	303	12/ 1/80	.08		72	11	136	7	-125	4	
49	304	12/ 6/80	.64		68	113	154	105	-41	8	
50	306	2/22/81	.20		74	29	148	28	-119	1	
51	307	4/ 4/81	.87		564	1288	211	174	1077	1114	*
52	308	4/ 8/81	.32		109	88	155	58	-67	30	
53	309	4/ 8/81	.37		199	197	137	62	60	135	
54	310	4/10/81	1.66		198	774	407	399	367	375	
55	311	4/13/81	1.21		138	446	296	272	150	174	
56	312	5/29/81	.16		160	39	156	22	-117	17	
57	313	5/29/81	.22		104	49	154	34	-105	15	
58	314	6/21/81	.89		47	100	215	180	-115	-80	
59	315	7/12/81	1.17		148	427	286	261	141	166	
60	316	7/12/81	.64		100	147	154	105	-7	42	
61	317	7/13/81	3.56		40	360	890	890	-530	-530	
62	318	7/17/81	.59		130	166	141	91	25	75	
63	319	7/20/81	.27		60	41	161	48	-120	-7	
64	320	7/27/81	.44		10	11	130	68	-119	-57	
65	321	8/14/81	.72		81	154	174	130	-20	24	
66	322	8/15/81	.01		137	2	1	0	1	2	
67	323	8/26/81	1.02		43	116	247	216	-131	-100	
68	324	8/27/81	.23		25	15	156	37	-141	-22	
69	325	8/29/81	.19		42	18	150	27	-132	-9	
70	326	8/31/81	1.85		45	220	456	452	-236	-232	
71	327	9/ 8/81	.55		23	34	140	86	-106	-52	
72	328	9/25/81	.09		9	2	142	9	-140	-7	
73	329	9/26/81	.29		53	40	160	53	-120	-13	
74	330	9/30/81	1.40		73	266	343	325	-77	-59	
75	331	9/30/81	.17		51	20	155	24	-135	-4	
76	332	10/ 6/81	.49		102	68	136	77	-68	-9	
77	333	10/14/81	1.06		16	45	258	227	-213	-182	
78	334	10/17/81	.81		58	123	196	159	-73	-36	
79	335	4/ 2/82	.28		190	121	161	51	-40	70	
80	336	4/ 2/82	.38		170	163	132	61	31	102	
81	337	4/ 2/82	.43		94	106	129	67	-23	39	
82	338	4/ 3/82	.96		128	299	232	199	67	100	
83	339	5/11/82	.49		304	361	136	77	225	284	
84	340	5/15/82	.17		204	79	155	24	-76	55	
85	341	5/21/82	.50		70	92	137	78	-45	14	
86	342	5/22/82	.53		35	34	139	83	-105	-49	

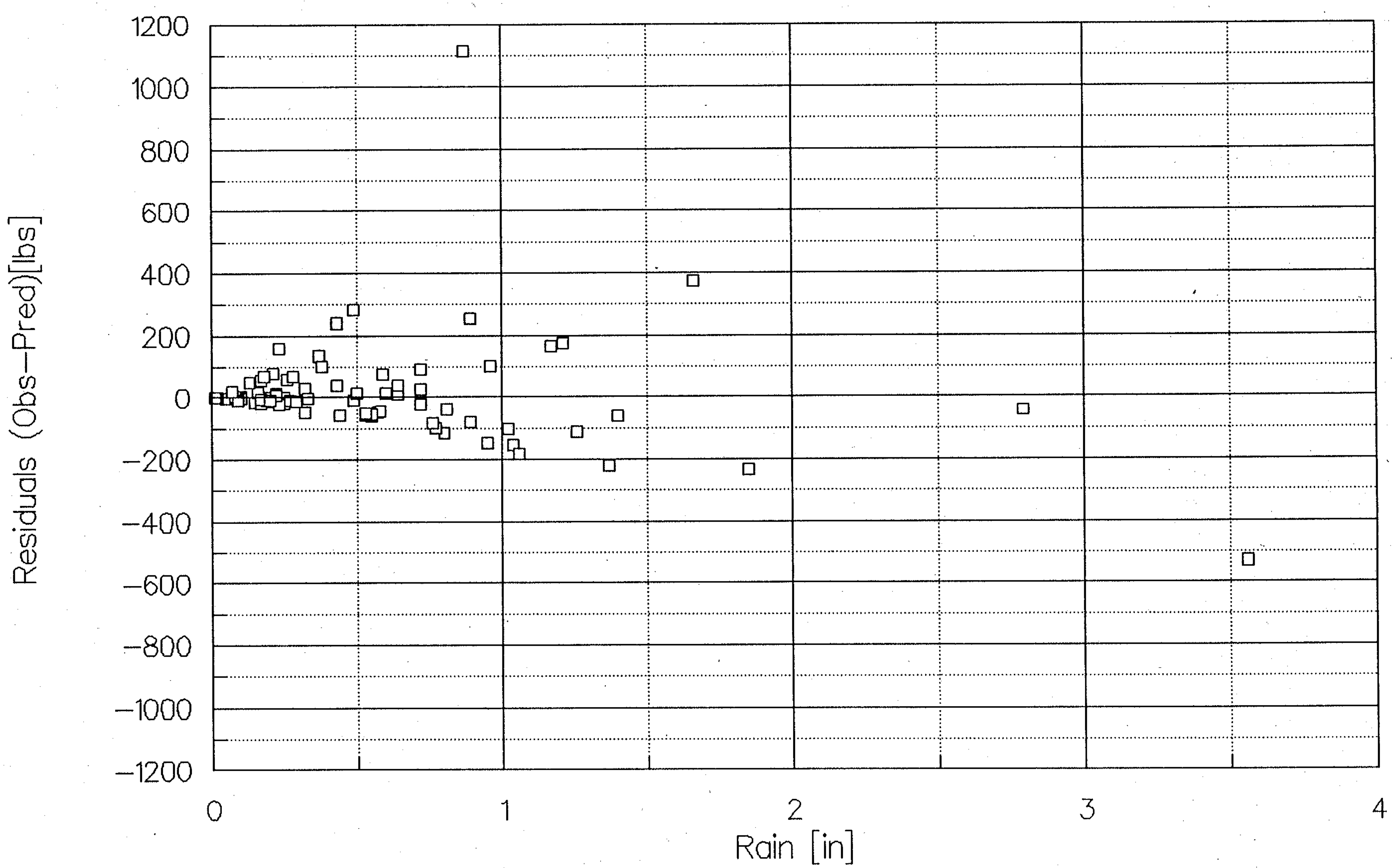
	A	B	C	Y	Z	AA	AB	AC	AD	AE	AF
10	POSTOO.CAL; w/ MILW6.RSV,				SS	SS	SS	SS	SS Resid	SS Resid	Outliers
11		DATE	RAIN		N.FILT.	N.FILT.	Calc w/o	Calc w/	Calc w/o	Calc w/	
12	Code #		(in)		RESID.	RESID.	Delivery	Delivery	Delivery	Delivery	
13					(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]	
14											
87	343	5/26/82	.22		75	42	154	34	-112	8	
88	344	5/27/82	.20		44	17	148	28	-131	-11	
89	345	6/ 7/82	.18		254	94	153	26	-59	68	
90	346	6/12/82	.07		184	28	134	6	-106	22	
91	347	6/15/82	.76		29	58	184	143	-126	-85	
92	348	6/20/82	.13		252	66	148	16	-82	50	
93	349	6/25/82	.33		73	59	153	60	-94	-1	
94											
95											
96	Minimum :		.01		6	1	1	0	-530	-530	
97	Maximum :		3.56		564	1288	890	890	1077	1114	
98	Average :		.57		95	128	189	114	-61	14	
99	Count :		79		79	79	79	79	79	79	
100	Std.Dev.:		.58		92	195	120	145	173	170	
101	Sum :		45.34		7496	10096	14943	9001	-4847	1095	
102	COV :		1.01		.97	1.53	.63	1.28			
103	SUM - Outlier :					8808		8827		-19	


Post Office
Observed vs Calc Suspended Solids [lbs]
w/ Delivery
Calculated Suspended Solids [lbs]
1000
100
10
1
1
10
100
1000
Observed Suspended Solids [lbs]
POSTOO.CAL; w/ MLW6.RSV, MLW11.PSC, DELIV2.PRR


Post Office
Suspended Solids: Predicted v Residuals
w/ Delivery at Outfall
Residuals [lbs]
1200
1000
800
600
400
200
0
−200
−400
−600
−800
−1000
−1200
1
10
100
1000
Predicted Suspended Solids [lbs]
POST00.CAL; w/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

Post Office
Suspended Solids: Rain v Residuals

w/ Delivery at Outfall



POST00.CAL; w/ MILW6.RSV, MILW11.PSC, DELIV2.PRR

B3

Rustler Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: RUSTØØ.DAT

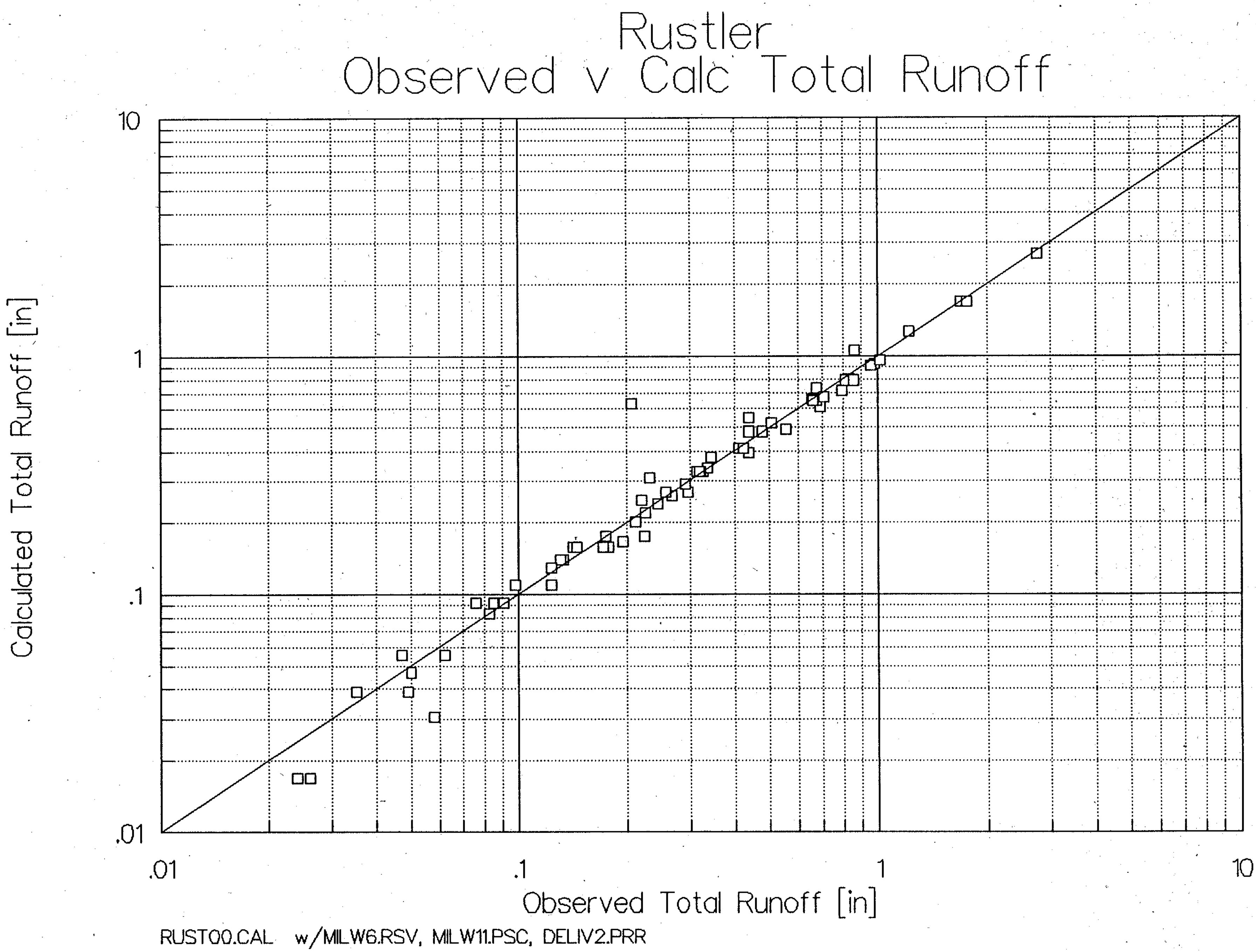
Rustler	Observed	Predicted	Residuals
Runoff [in]			
Average	0.47	0.47	-0.001
Std Dev	0.49	0.48	—
COV	1.05	1.02	—
Sum	31.80	31.89	-0.09
Count	68		
Runoff - outliers [in]			
Average	0.44	0.45	-0.003
Std Dev	0.47	0.46	—
COV	1.06	1.03	—
Sum	29.25	29.42	-0.17
Count	66		
Rv			
Average	0.79	0.78	0.01
Std Dev	0.15	0.14	—
COV	0.19	0.18	—
SS w/Delivery [lbs]			
Average	88	67	21
Std Dev	160	77	—
COV	1.81	1.15	—
Sum	5898	4510	1388
Count	67		
SS w/Delivery - outliers [lbs]			
Average	66	63	3
Std Dev	97	74	—
COV	1.47	1.17	—
Sum	4318	4124	194
Count	65		

filename: DATASUM.WK1

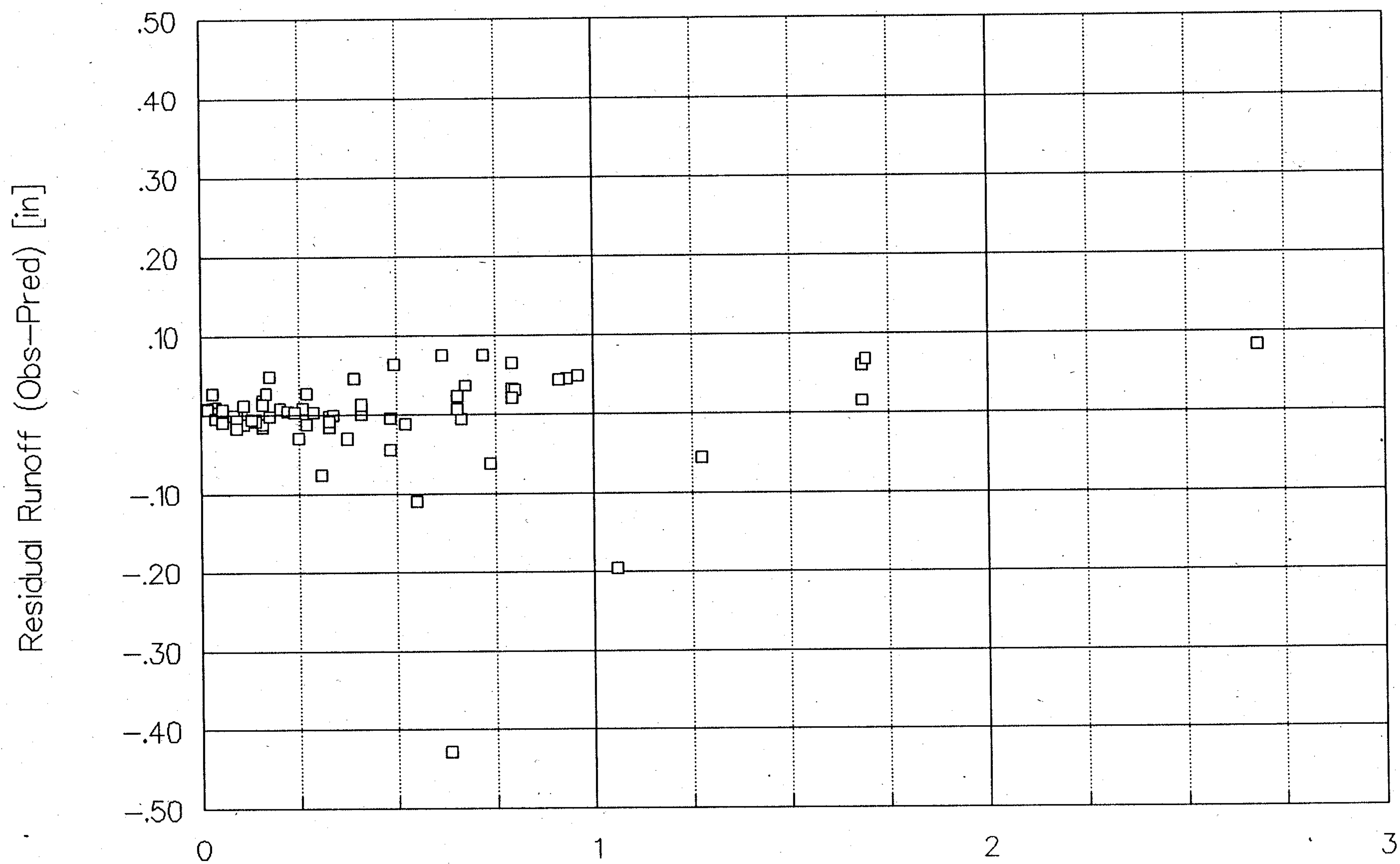
JGV / RTB

	A	B	C	D	E	F	G	H	I	J	K	L	M
10	RUSTOO.CAL	w/MILW6.RSV, MILW11.PSC, DELIV2.PRR					CALC	RESID	RESID/		OBS	CALC	RESID
11				Obs Ttl	Obs Ttl	Clc Ttl	TOTAL	TOTAL	OBS TTL		TOTAL	TOTAL	TOTAL
12	CODE	DATE	RAIN	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF			Rv	Rv	Rv
13	. # .		(in)	(in)	(cu ft)	[in]	(cu ft)	[in]	(%)		(in/in)	(in/in)	(in/in)
15	196	4/ 4/80	.21	.18	7967	.16	7093	.02	.11		.84	.75	.09
16	197	4/ 9/80	.32	.27	12018	.26	11623	.01	.03		.83	.81	.02
17	198	4/14/80	.19	.13	5987	.14	6270	-.01	-.05		.70	.73	-.03
18	199	5/13/80	.21	.14	6392	.16	7093	-.02	-.11		.68	.75	-.07
19	200	6/ 5/80	.89	.83	37135	.79	35646	.03	.04		.93	.89	.04
20	201	6/27/80	.39	.31	14134	.33	14798	-.01	-.05		.81	.84	-.03
21	202	7/16/80	1.04	.98	43977	.93	41937	.05	.05		.94	.90	.04
22	203	7/26/80	1.82	1.74	78366	1.68	75648	.06	.03		.96	.92	.04
23	204	8/ 2/80	1.82	1.70	76340	1.68	75648	.02	.01		.93	.92	.01
24	205	8/ 7/80	.90	.83	37450	.80	36055	.03	.04		.92	.89	.03
25	206	8/ 7/80	.70	.69	31058	.61	27648	.08	.11		.99	.88	.11
26	208	8/11/80	.56	.48	21561	.48	21722	.00	-.01		.86	.86	
27	209	8/13/80	.05	.03	1170	.02	764	.01	.35		.52	.34	.18
28	210	8/16/80	.39	.33	14719	.33	14798	.00	-.01		.84	.84	
29	211	8/19/80	.48	.41	18500	.41	18443	.00			.86	.85	.01
30	213	9/20/80	.74	.68	30473	.65	29382	.02	.04		.91	.88	.03
31	214	9/22/80	.89	.81	36640	.79	35646	.02	.03		.91	.89	.02
32	215	9/22/80	.26	.21	9498	.20	9083	.01	.04		.81	.78	.03
33	216	9/25/80	.08	.05	2206	.04	1739	.01	.21		.61	.48	.13
34	217	10/ 3/80	.05	.02	1080	.02	764	.01	.29		.48	.34	.14
35	218	10/16/80	.09	.05	2251	.05	2105	.00	.06		.56	.52	.04
36	219	10/17/80	.57	.56	25027	.49	22136	.06	.12		.98	.86	.12
37	220	10/24/80	.21	.15	6527	.16	7093	-.01	-.09		.69	.75	-.06
38	221	11/23/80	.14	.09	4096	.09	4136	.00	-.01		.65	.66	-.01
39	222	12/ 8/80	.23	.17	7832	.17	7875	.00	-.01		.76	.76	
40	223	2/22/81	.33	.30	13324	.27	12063	.03	.09		.90	.81	.09
41	224	4/22/81	.19	.13	5897	.14	6270	-.01	-.06		.69	.73	-.04
42	225	5/10/81	.56	.44	19715	.48	21722	-.04	-.10		.78	.86	-.08
43	226	5/23/81	.08	.04	1575	.04	1739	.00	-.10		.44	.48	-.04
44	227	5/29/81	.16	.10	4411	.11	4948	-.01	-.12		.61	.69	-.08
45	228	5/29/81	.72	.21	9272	.63	28513	-.43	-2.08		.29	.88	-.59
46	229	6/ 8/81	.13	.08	3736	.08	3751	.00			.64	.64	
47	230	6/15/81	.10	.05	2116	.06	2504	-.01	-.18		.47	.56	-.09
48	231	6/21/81	.83	.68	30428	.74	33194	-.06	-.09		.81	.89	-.08
49	232	7/12/81	1.17	.86	38845	1.06	47675	-.20	-.23		.74	.91	-.17
50	233	7/12/81	.63	.44	19715	.55	24654	-.11	-.25		.70	.87	-.17
51	234	7/13/81	2.83	2.77	124503	2.68	120769	.08	.03		.98	.95	.03
52	235	8/ 7/81	.10	.06	2791	.06	2504	.01	.10		.62	.56	.06
53	336	8/14/81	.60	.51	22821	.52	23387	-.01	-.02		.85	.87	-.03
54	237	8/15/81	.37	.23	10398	.31	13868	-.08	-.33		.62	.83	-.21
55	238	8/26/81	1.02	.96	43076	.91	41064	.04	.05		.94	.89	.05
56	239	8/27/81	.23	.22	10038	.17	7875	.05	.22		.97	.76	.21
57	241	8/31/81	1.83	1.76	79176	1.69	76094	.07	.04		.96	.92	.04
58	242	9/21/81	.28	.23	10128	.22	9911	.00	.02		.80	.79	.01
59	243	9/30/81	1.40	1.22	54870	1.28	57395	-.06	-.05		.87	.91	-.04
60	244	10/14/81	1.07	1.01	45462	.96	43252	.05	.05		.94	.90	.04
61	245	10/17/81	.40	.34	15169	.34	15223	.00			.84	.85	-.01
62	246	10/17/81	.46	.44	19760	.39	17633	.05	.11		.95	.85	.10
63	247	3/12/82	.22	.19	8732	.17	7482	.03	.14		.88	.76	.12
64	248	3/16/82	.30	.24	10938	.24	10758	.00	.02		.81	.80	.01
65	249	3/19/82	.35	.29	13098	.29	12956	.00	.01		.83	.82	.01
66	250	4/ 2/82	.31	.22	9903	.25	11188	-.03	-.13		.71	.80	-.09
67	251	4/ 2/82	.39	.32	14449	.33	14798	-.01	-.02		.82	.84	-.02
68	252	4/ 2/82	.81	.80	35785	.72	32379	.08	.10		.98	.89	.09
69	253	4/ 3/82	.75	.66	29573	.66	29818	-.01	-.01		.88	.88	
70	254	4/16/82	.89	.86	38620	.79	35646	.07	.08		.96	.89	.07
71	255	5/11/82	.39	.32	14404	.33	14798	-.01	-.03		.82	.84	-.02
72	256	5/15/82	.14	.09	3826	.09	4136	-.01	-.08		.61	.66	-.05
73	257	5/21/82	.44	.34	15484	.37	16826	-.03	-.09		.78	.85	-.07
74	258	5/22/82	.48	.42	19040	.41	18443	.01	.03		.88	.85	.03
75	259	5/26/82	.21	.17	7697	.16	7093	.01	.08		.81	.75	.06
76	260	5/27/82	.16	.12	5536	.11	4948	.01	.11		.77	.69	.08
77	261	6/ 7/82	.14	.08	3421	.09	4136	-.02	-.21		.54	.66	-.12
78	262	6/12/82	.07	.06	2611	.03	1374	.03	.47		.83	.44	.39
79	263	6/15/82	.74	.66	29708	.65	29382	.01	.01		.89	.88	.01
80	264	6/20/82	.76	.71	31914	.67	30255	.04	.05		.93	.88	.05
81	265	6/25/82	.33	.26	11523	.27	12063	-.01	-.05		.78	.81	-.03
82	266	6/29/82	.18	.12	5536	.13	5816	-.01	-.05		.68	.72	-.04
83													
84													
85	Maximum :		2.83	2.77	124503	2.68	120769	.08	34.7%		.99	.95	.39
86	Minimum :		.05	.02	1080	.02	764	-.43	-207.5%		.29	.34	-.59

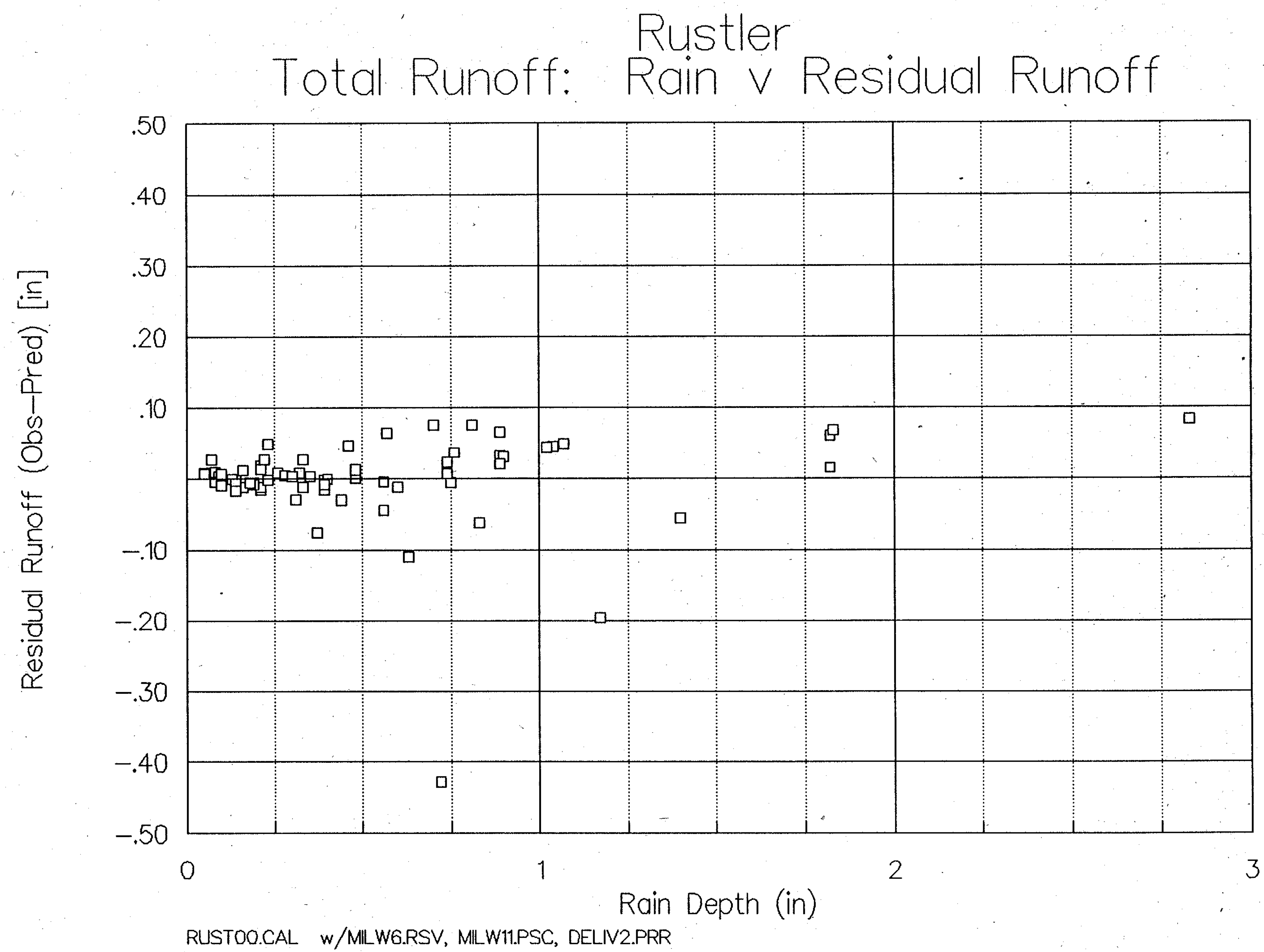
	A	B	C	D	E	F	G	H	I	J	K	L	M
10	RUST00.CAL	w/MILW6.RSV, MILW11.PSC, DELIV2.PRR					CALC	RESID	RESID/		OBS	CALC	RESID
11				Obs Ttl	Obs Ttl	Clc Ttl	TOTAL	TOTAL	OBS TTL		TOTAL	TOTAL	TOTAL
12	CODE	DATE	RAIN	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF			Rv	Rv	Rv
13	. # .		(in)	(in)	(cu ft)	[in]	(cu ft)	[in]	(%)		(in/in)	(in/in)	(in/in)
87	Average :		.54	.47	21050	.47	21110	-.001	-1.9%		.79	.78	.01
88	Count :		68	68	68	68	68	68	65		68	68	68
89	Std.Dev.:		.50	.49	22089	.48	21552	.07	28.3%		.15	.14	.12
90	Sum :		36.78	31.80	1431427	31.89	1435448	-.09	-.3%		53.57	53.20	.37
91	COV :		.93	1.05	1.05	1.02	1.02				.19	.18	
92	Outlier Adj:												


Rustler
Observed v Calc Total Runoff
Calculated Total Runoff [in]
10
1
.1
.01
.01
.1
1
10
Observed Total Runoff [in]
RUST00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

Rustler
Total Runoff: Predicted Runoff v Residuals



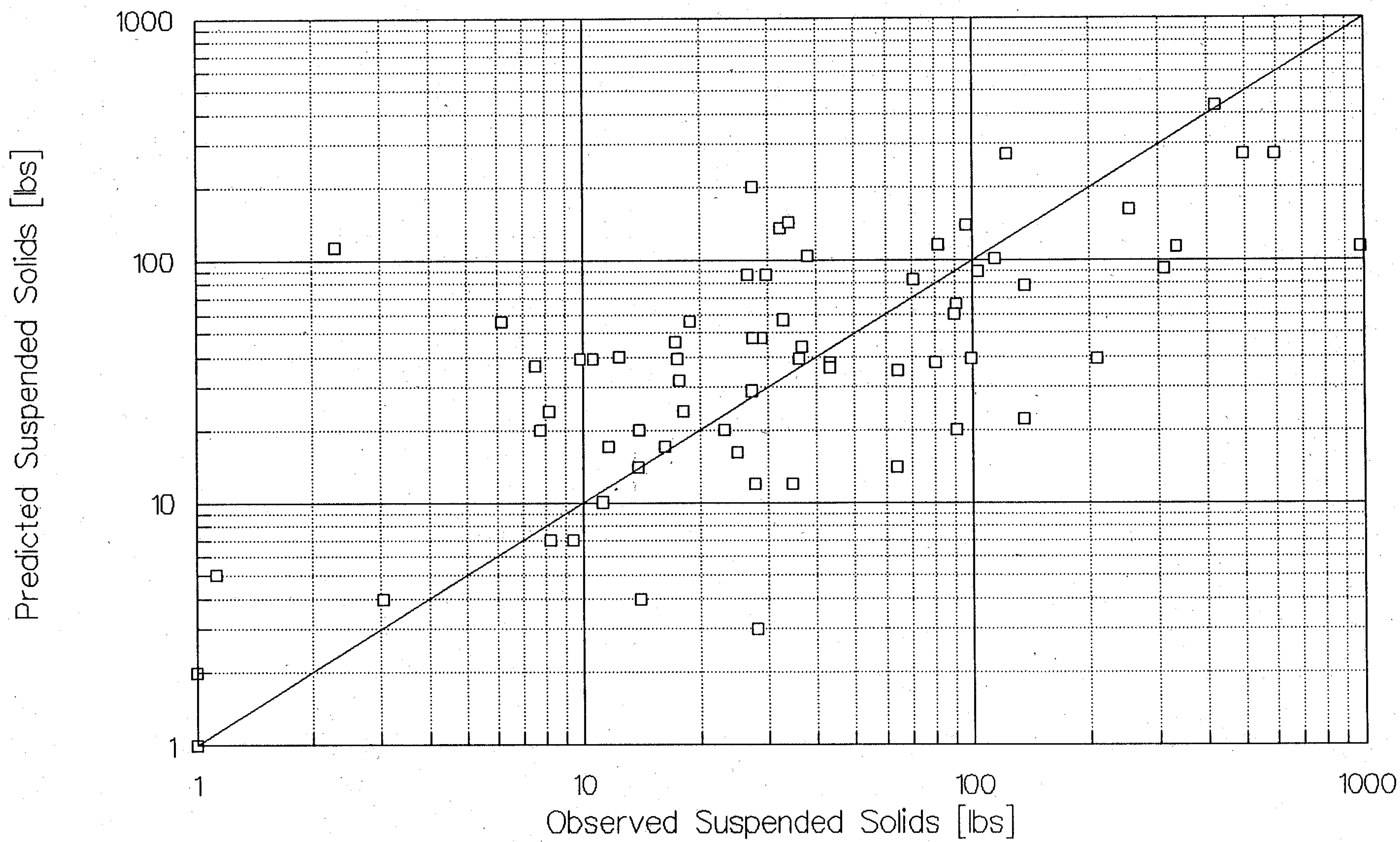
RUST00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR


Rustler
Total Runoff: Rain v Residual Runoff
.50
.40
.30
.20
.10
−.10
−.20
−.30
−.40
−.50
Residual Runoff (Obs−Pred) [in]
0
1
2
3
Rain Depth (in)
RUST00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

Row	A	B	C	AC	AD	AE	AF	AG	AH	AI	AJ
10	RUST00.CAL	W/MILW6.RSV,			Obsvd	Obsvd	Calc SS	Calc SS	SS Resid	SS Resid	
11					TSS	TSS	w/o	w/	w/o	w/	Outliers
12	CODE	DATE	RAIN				Deliv	Deliv	Deliv	Deliv	
13	. # .		(in)		(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]	
15	196	4/ 4/80	.21		28	14	90	20	-76	-6	
16	197	4/ 9/80	.32		10	8	93	37	-85	-29	
17	198	4/14/80	.19		31	12	89	17	-77	-5	
18	199	5/13/80	.21		228	91	90	20	1	71	
19	200	6/ 5/80	.89		144	334	132	114	202	220	
20	201	6/27/80	.39		12	11	76	39	-65	-28	
21	202	7/16/80	1.04		35	96	154	139	-58	-43	
22	203	7/26/80	1.82		25	122	274	272	-152	-150	
23	204	8/ 2/80	1.82		125	596	274	272	322	324	*
24	205	8/ 7/80	.90		35	82	133	116	-51	-34	
25	206	8/ 7/80	.70		70	136	103	79	33	57	
26	208	8/11/80	.56		14	19	86	56	-67	-37	
27	209	8/13/80	.05		3	0	64	2	-64	-2	
28	210	8/16/80	.39		19	17	76	39	-59	-22	
29	211	8/19/80	.48		25	29	82	48	-53	-19	
30	213	9/20/80	.74		14	27	109	87	-82	-60	
31	214	9/22/80	.89		1	2	132	114	-130	-112	
32	215	9/22/80	.26		46	27	96	29	-69	-2	
33	216	9/25/80	.08		22	3	80	4	-77	-1	
34	217	10/ 3/80	.05		12	1	64	2	-63	-1	
35	218	10/16/80	.09		8	1	84	5	-83	-4	
36	219	10/17/80	.57		21	33	86	57	-53	-24	
37	220	10/24/80	.21		19	8	90	20	-82	-12	
38	221	11/23/80	.14								
39	222	12/ 8/80	.23		37	18	93	24	-75	-6	
40	223	2/22/81	.33		52	43	92	38	-49	5	
41	224	4/22/81	.19		44	16	89	17	-73	-1	
42	225	5/10/81	.56		5	6	86	56	-80	-50	
43	226	5/23/81	.08		142	14	80	4	-66	10	
44	227	5/29/81	.16		232	64	92	14	-28	50	
45	228	5/29/81	.72		122	71	106	83	-35	-12	
46	229	6/ 8/81	.13		48	11	88	10	-77	1	
47	230	6/15/81	.10		71	9	85	7	-76	2	
48	231	6/21/81	.83		20	38	123	104	-85	-66	
49	232	7/12/81	1.17		104	252	175	162	77	90	
50	233	7/12/81	.63		74	91	92	66	-1	25	
51	234	7/13/81	2.83		54	420	433	433	-13	-13	
52	235	8/ 7/81	.10		47	8	85	7	-77	1	
53	336	8/14/81	.60		63	90	88	60	2	30	
54	237	8/15/81	.37		19	12	82	40	-70	-28	
55	238	8/26/81	1.02		12	32	151	136	-119	-104	
56	239	8/27/81	.23		13	8	93	24	-85	-16	
57	241	8/31/81	1.83		100	494	276	274	218	220	
58	242	9/21/81	.28		28	18	96	32	-78	-14	
59	243	9/30/81	1.40		8	27	209	201	-182	-174	
60	244	10/14/81	1.07		12	34	159	144	-125	-110	
61	245	10/17/81	.40		38	36	75	39	-39	-3	
62	246	10/17/81	.46		14	17	81	46	-64	-29	
63	247	3/12/82	.22		248	135	92	22	43	113	
64	248	3/16/82	.30		94	64	95	35	-31	29	
65	249	3/19/82	.35		12	10	88	39	-78	-29	
66	250	4/ 2/82	.31		70	43	94	36	-51	7	
67	251	4/ 2/82	.39		110	99	76	39	23	60	
68	252	4/ 2/82	.81		51	114	120	101	-6	13	
69	253	4/ 3/82	.75		56	103	111	90	-8	13	
70	254	4/16/82	.89		408	984	132	114	852	870	*
71	255	5/11/82	.39		232	209	76	39	133	170	
72	256	5/15/82	.14		116	28	90	12	-62	16	
73	257	5/21/82	.44		38	37	79	44	-42	-7	
74	258	5/22/82	.48		23	27	82	48	-55	-21	
75	259	5/26/82	.21		48	23	90	20	-67	3	
76	260	5/27/82	.16		40	14	92	14	-78	0	
77	261	6/ 7/82	.14		162	35	90	12	-55	23	
78	262	6/12/82	.07		172	28	79	3	-51	25	
79	263	6/15/82	.74		16	30	109	87	-79	-57	
80	264	6/20/82	.76		156	311	112	92	199	219	
81	265	6/25/82	.33		112	81	92	38	-11	43	
82	266	6/29/82	.18		72	25	91	16	-66	9	
83											
84											
85	Maximum :		2.83		408	984	433	433	852	870	
86	Minimum :		.05		1	0	64	2	-182	-174	

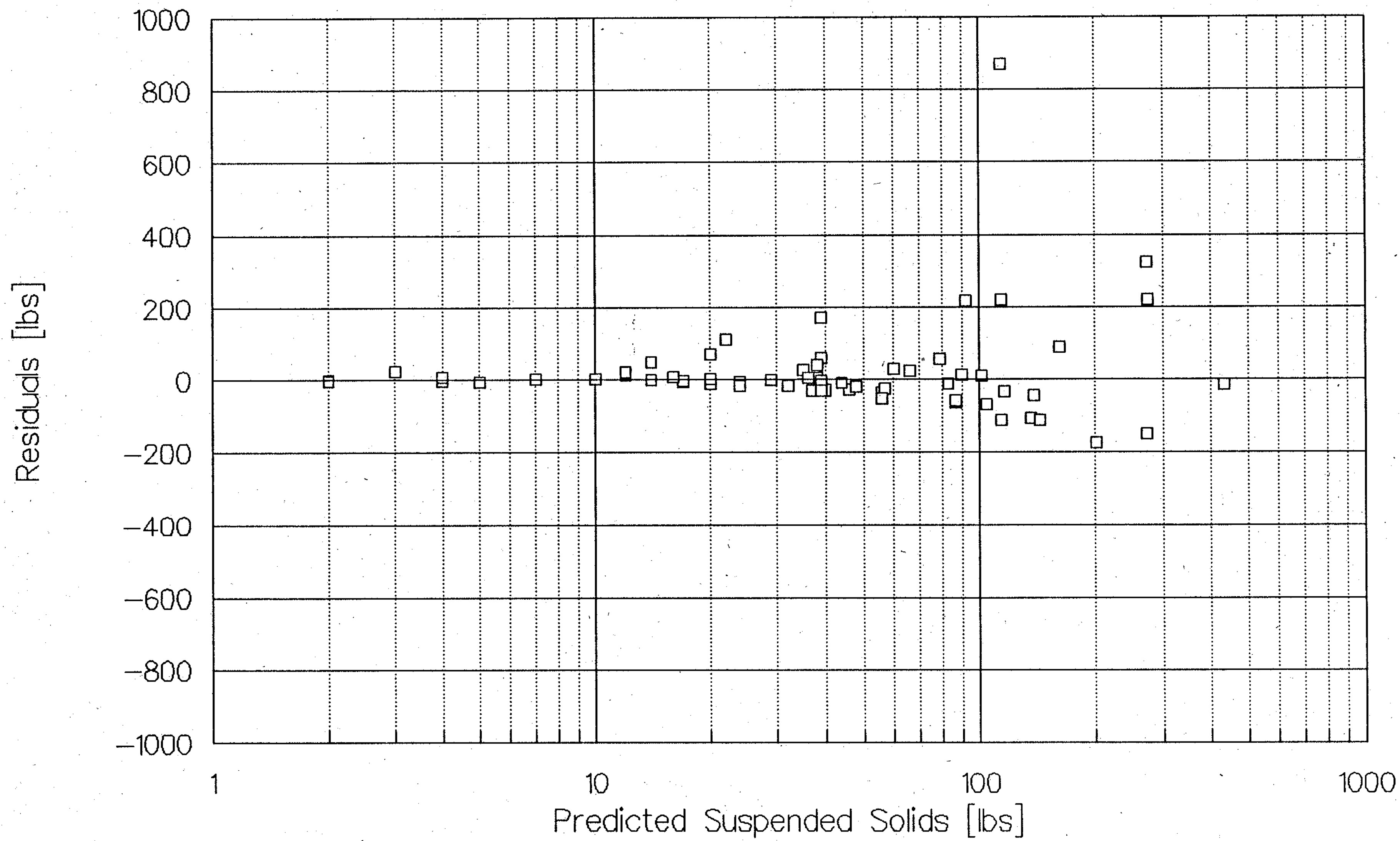
	A	B	C	AC	AD	AE	AF	AG	AH	AI	AJ
10	RUSTOO.CAL	w/MILW6.RSV,			Obsvd	Obsvd	Calc SS	Calc SS	SS Resid	SS Resid	
11					TSS	TSS	w/o	w/	w/o	w/	Outliers
12	CODE	DATE	RAIN				Deliv	Deliv	Deliv	Deliv	
13	. # .		(in)		(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]	
87	Average :		.54		68	88	112	67	-24	21	
88	Count :		68		67	67	67	67	67	67	
89	Std.Dev.:		.50		74	160	60	77	137	132	
90	Sum :		36.78		4542	5898	7476	4510	-1578	1388	
91	COV :		.93		1.09	1.81	.53	1.15	-5.80	6.35	
92	Outlier Adj:					4318		4124		194	

Rustler Suspended Solids
Observed vs Calculated Suspended Solids
w/ Delivery at Outfall

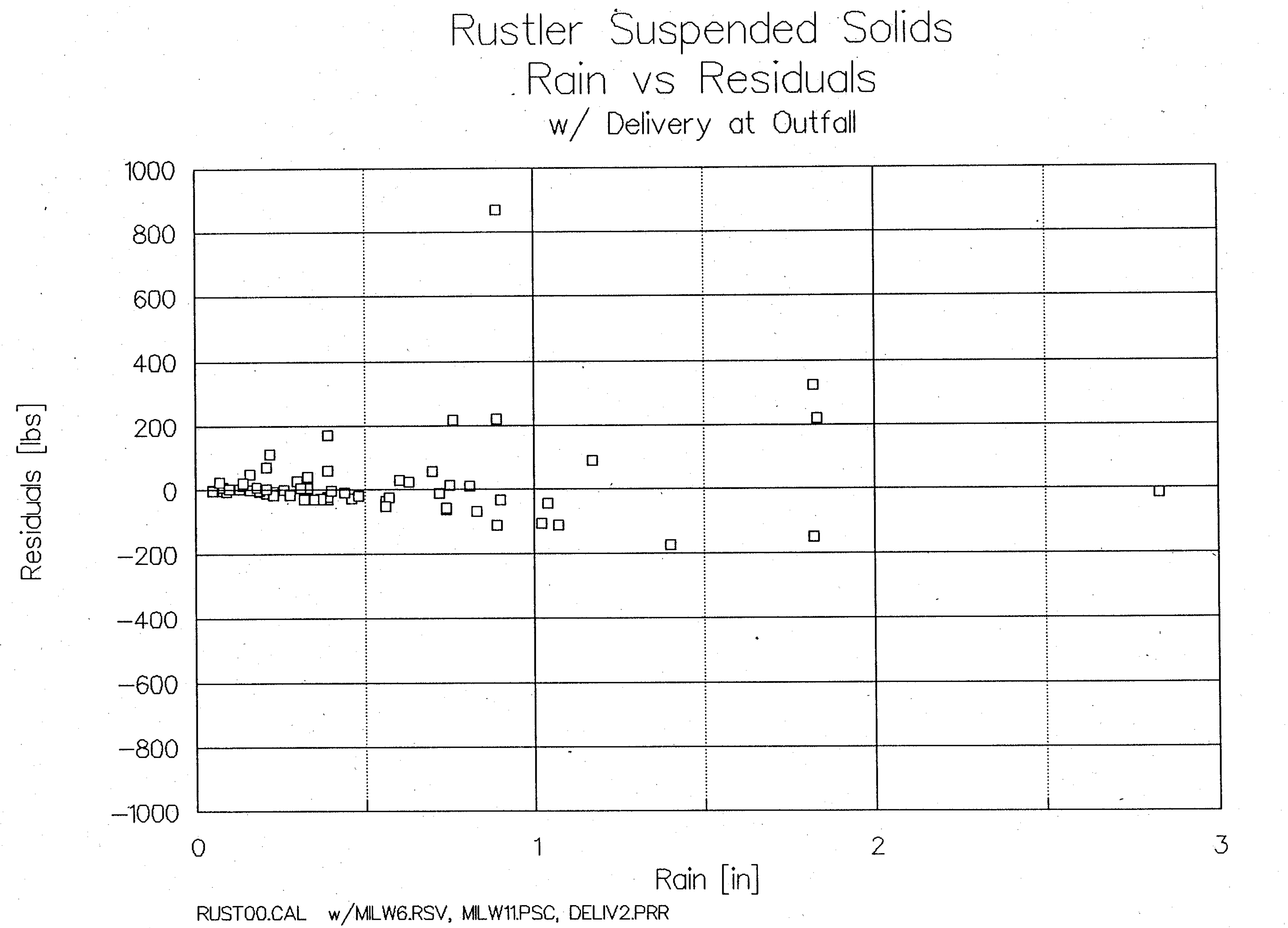


RUST00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

Rustler Suspended Solids
Predicted vs Residuals
w/ Delivery at Outfall



RUST00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR


Rustler Suspended Solids
Rain vs Residuals
w/ Delivery at Outfall
Residuals [lbs]
1000
800
600
400
200
0
−200
−400
−600
−800
−1000
0
1
2
3
Rain [in]
RUST00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

B4

Hastings 1980-1982 Study Area Results

SLAMM Calibration Data Summary Sheet

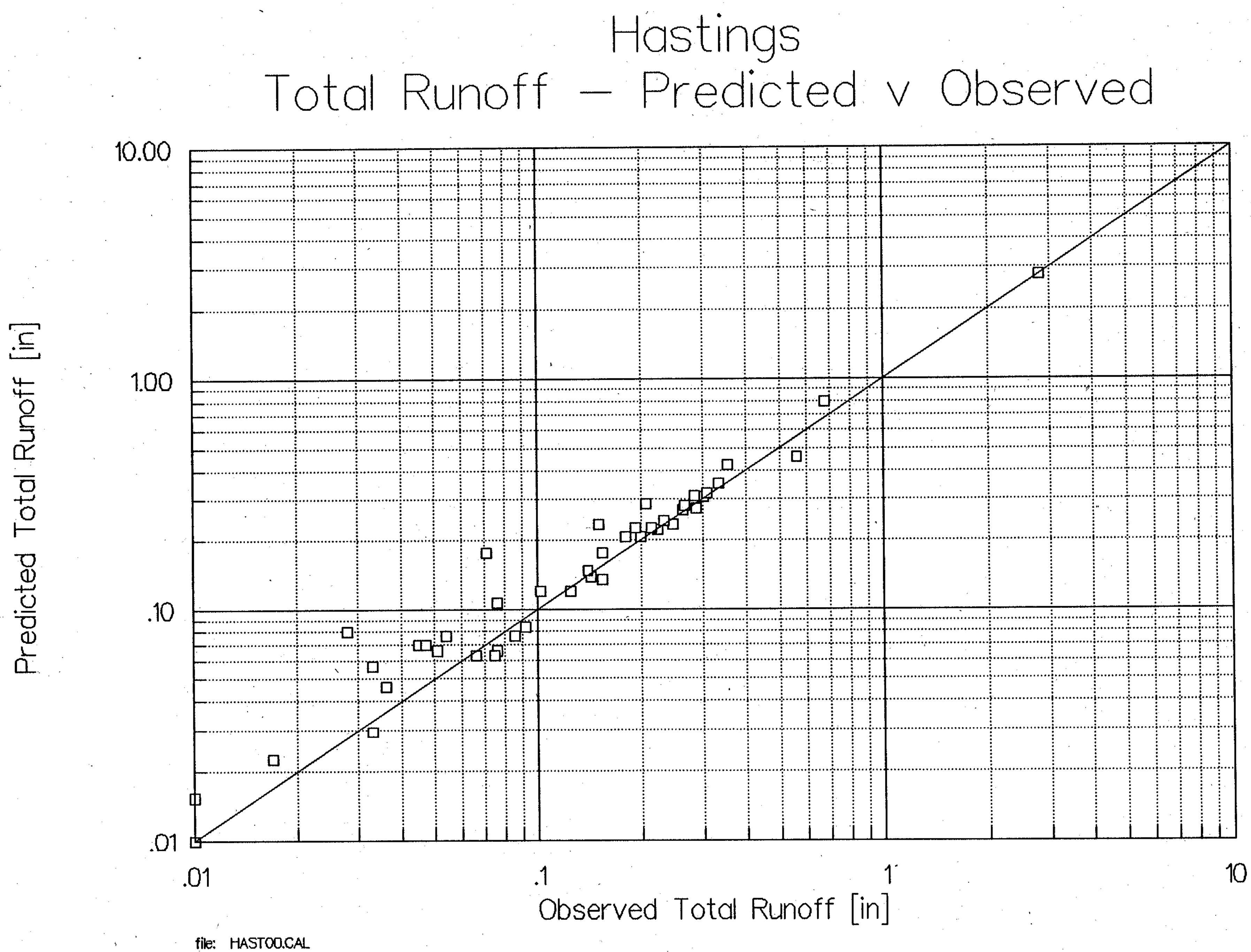
Site Data File Name: HASTØØ.DAT

Hastings	Observed	Predicted	Residuals
Runoff [in]			
Average	0.23	0.24	-0.02
Std Dev	0.42	0.42	—
COV	1.83	1.72	—
Sum	10.01	10.69	-0.68
Count	44		
Runoff – outliers [in]			
Average	0.22	0.24	-0.02
Std Dev	0.42	0.42	—
COV	1.91	1.77	—
Sum	9.45	10.23	-0.79
Count	43		
Rv			
Average	0.28	0.31	-0.03
Std Dev	0.10	0.07	—
COV	0.34	0.24	—
SS w/Delivery [lbs]			
Average	114	93	21
Std Dev	240	138	—
COV	2.10	1.48	—
Sum	5018	4107	911
Count	44		
SS w/Delivery – outliers [lbs]			
Average	89	91	-2
Std Dev	175	139	—
COV	1.97	1.53	—
Sum	3814	3920	-106
Count	43		

filename: DATASUM.WK1

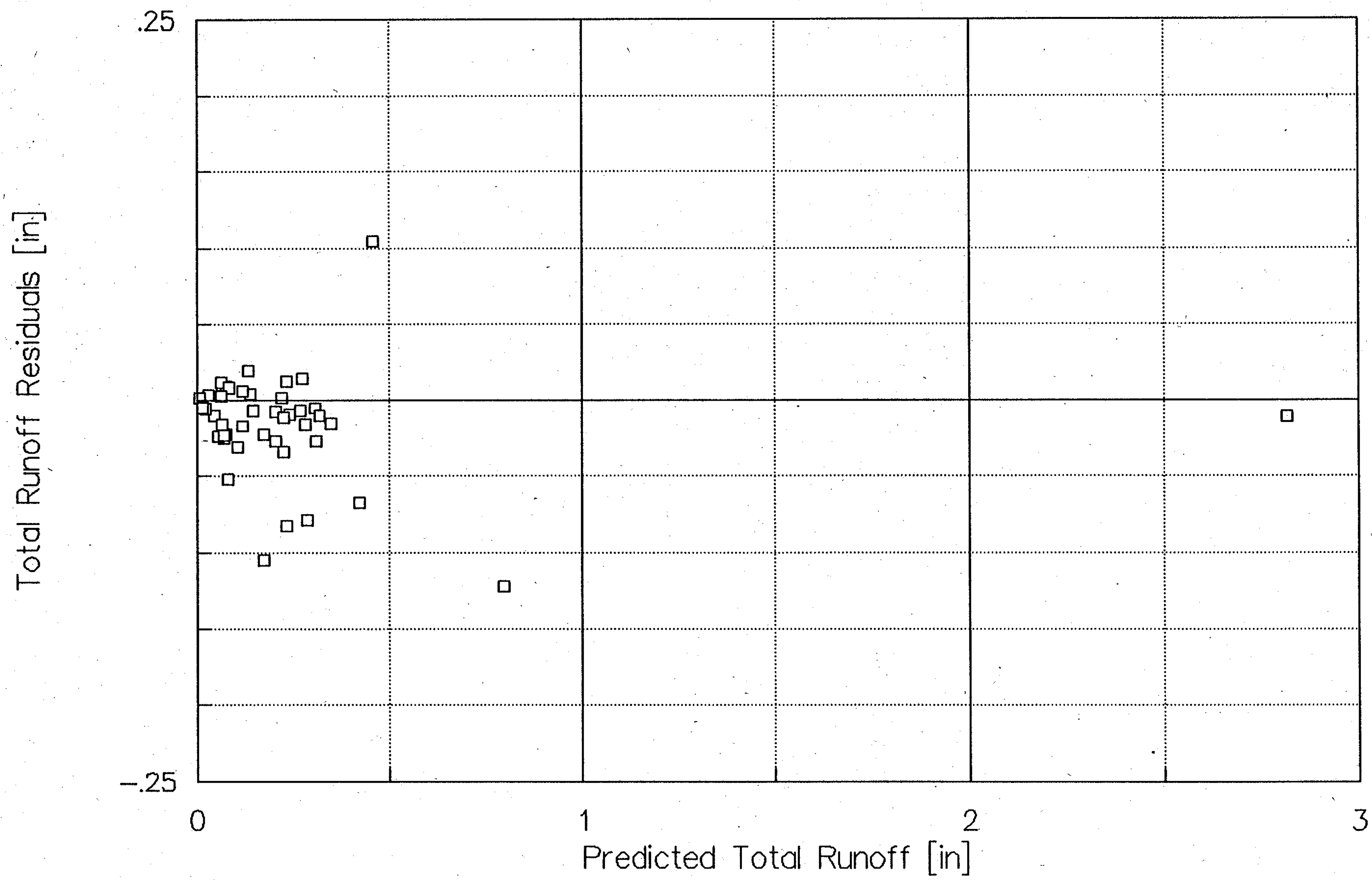
JGV/RTB

	A	B	C	D	E	F	G	H	I	J	K	L	M
10	file:	HASTOO.CAL			OBS	SLAMM	SLAMM	RESID	RESID/		OBS	SLAMM	RESID
11				Obs Ttl	TOTAL	TOTAL	TOTAL	TOTAL	OBS TTL		TOTAL	TOTAL	TOTAL
12	CODE	DATE	RAIN	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF		RV	RV	RV
13	. # .		(in)	(in)	(cu ft)	[in]	(cu ft)	[in]	[ ]		(in/in)	(in/in)	(in/in)
14													
15	404	6/ 2/80	.25	.08	8892	.07	7766	.01	.13		.30	.27	.03
16	405	6/ 6/80	.67	.25	28781	.23	27329	.01	.05		.37	.35	.02
17	406	6/ 7/80	.60	.20	23282	.21	24148	-.01	-.04		.33	.34	-.01
18	407	6/28/80	.44	.14	16730	.14	16191		.03		.33	.31	.02
19	408	7/26/80	1.12	.35	41416	.42	49294	-.07	-.19		.32	.38	-.06
20	409	8/ 2/80	.26	.05	5265	.07	8160	-.02	-.55		.17	.27	-.10
21	410	8/ 4/80	4.87	2.81	328288	2.82	329536	-.01			.58	.58	
22	411	8/ 7/80	.65	.19	22463	.23	26412	-.03	-.18		.30	.35	-.05
23	412	8/11/80	.64	.22	26090	.22	25956		.01		.35	.35	
24	413	8/16/80	.28	.09	10062	.08	8970	.01	.11		.31	.27	.04
25	414	8/19/80	.24	.08	8775	.06	7378	.01	.16		.31	.26	.05
26	415	9/12/80	.95	.33	38959	.35	40731	-.02	-.05		.35	.37	-.02
27	416	9/16/80	.85	.30	35215	.31	35830	-.01	-.02		.35	.36	-.01
28	417	9/20/80	.69	.23	27143	.24	28252	-.01	-.04		.34	.35	-.01
29	418	9/25/80	.15	.03	3861	.03	3449		.11		.22	.20	.02
30	419	10/16/80	.30	.09	10764	.08	9806	.01	.09		.31	.28	.03
31	420	10/24/80	.24	.07	7722	.06	7378		.04		.28	.26	.02
32	421	12/ 6/80	.46	.14	16379	.15	17132	-.01	-.05		.30	.32	-.02
33	424	2/22/81	.76	.26	30770	.27	31531	-.01	-.02		.35	.35	
34	425	2/27/81	.22	.03	3861	.06	6621	-.02	-.71		.15	.26	-.11
35	426	4/ 4/81	.80	.21	24218	.29	33434	-.08	-.38		.26	.36	-.10
36	427	4/ 8/81	.36	.08	8892	.11	12474	-.03	-.40		.21	.30	-.09
37	428	4/ 8/81	.77	.29	33695	.27	32006	.01	.05		.37	.36	.01
38	429	4/10/81	1.20	.56	65634	.46	53423	.10	.19		.47	.38	.09
39	430	4/13/81	.53	.15	18017	.18	20571	-.02	-.14		.29	.33	-.04
40	431	4/22/81	.19	.04	4212	.05	5398	-.01	-.28		.19	.24	-.05
41	432	5/10/81	.67	.15	17666	.23	27329	-.08	-.55		.23	.35	-.12
42	433	5/23/81	.29	.03	3276	.08	9384	-.05	-1.86		.10	.28	-.18
43	434	5/29/81	.06	.01	1053	.01	824		.22		.15	.12	.03
44	435	6/ 8/81	.13	.02	1989	.02	2644	-.01	-.33		.13	.17	-.04
45	436	6/13/81	.53	.07	8307	.18	20571	-.10	-1.48		.13	.33	-.20
46	437	6/15/81	.88	.31	36151	.32	37285	-.01	-.03		.35	.36	-.01
47	438	6/20/81	.65	.21	25037	.23	26412	-.01	-.05		.33	.35	-.02
48	439	7/25/81	.39	.13	14624	.12	13900	.01	.05		.32	.30	.02
49	440	7/27/81	.28	.05	6318	.08	8970	-.02	-.42		.19	.27	-.08
50	441	3/12/82	.60	.18	21059	.21	24148	-.03	-.15		.30	.34	-.04
51	443	3/15/82	.10	.01	1170	.02	1793	-.01	-.53		.10	.15	-.05
52	444	3/16/82	.43	.15	18017	.13	15727	.02	.13		.36	.31	.05
53	446	3/20/82	.39	.10	11933	.12	13900	-.02	-.16		.26	.30	-.04
54	447	4/ 2/82	1.89	.68	78972	.80	93315	-.12	-.18		.36	.42	
55	448	5/11/82	.86	.28	33227	.31	36314	-.03	-.09		.33	.36	-.03
56	449	5/22/82	.25	.05	5967	.07	7766	-.02	-.30		.20	.27	-.07
57	450	5/26/82	.26	.05	5499	.07	8160	-.02	-.48		.18	.27	-.09
58	451	6/15/82	.79	.27	31121	.28	32959	-.02	-.06		.34	.36	-.02
59													
60	Minimum :		.06	.01	1053	.01	824	-.12	-1.86		.10	.12	-.20
61	Maximum :		4.87	2.81	328288	2.82	329536	.10	.22		.58	.58	.09
62	Average :		.64	.23	26608	.24	28422	-.02	-.19		.28	.31	-.03
63	Std.Dev.:		.73	.42	48779	.42	48952	.04	.39		.10	.07	.06
64	Count :		44	44	44	44	44	44	44		44	44	43
65	COV :		1.15	1.83	1.83	1.72	1.72				.34	.24	
66	Sum :		27.94	10.01	1170768	10.69	1250577	-.68	-8.39		12.45	13.76	-1.25



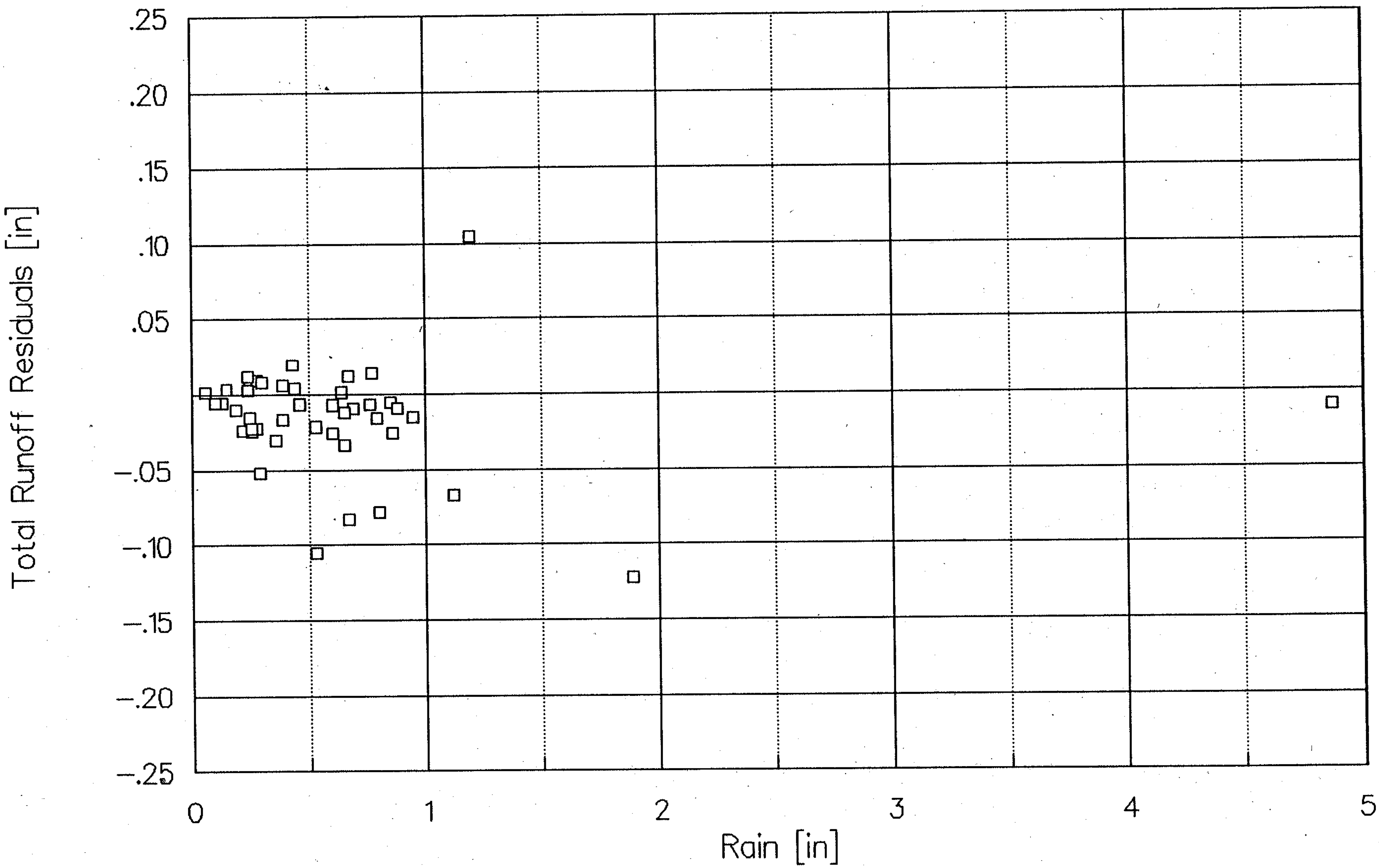
Hastings
Total Runoff — Predicted v Observed
10.00
1.00
.10
.01
Predicted Total Runoff [in]
.01
.1
1
10
Observed Total Runoff [in]
file: HAST00.CAL

Hastings
Total Runoff Residuals vs Predicted Runoff



file: HASTOO.CAL

Hastings
Total Runoff: Rain vs Residuals



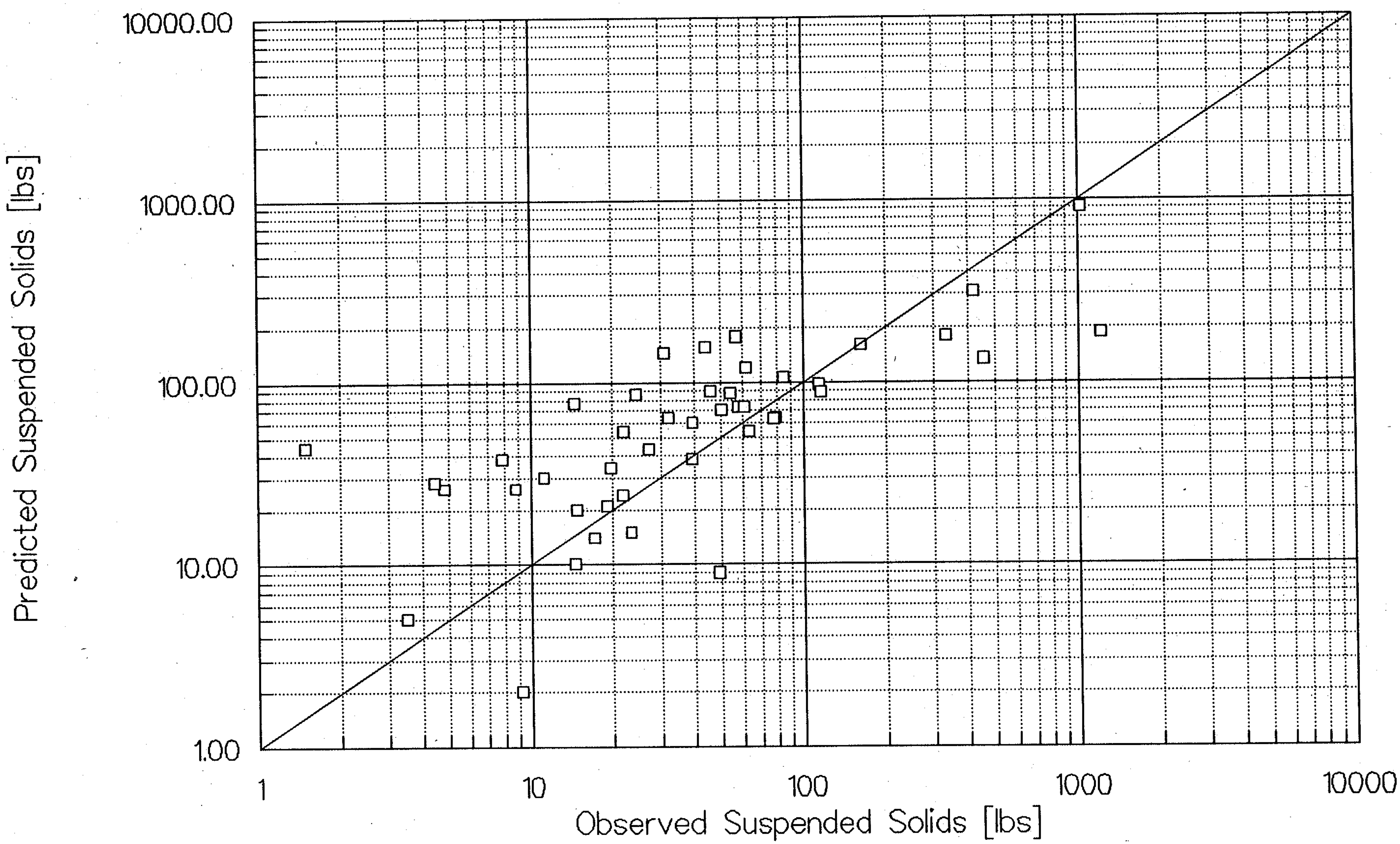
file: HAST00.CAL
Residuals = Observed – Predicted

	A	B	C	X	Y	Z	AA	AB	AC	AD	AE	AF
10	file:	HASTOO.CAL		SS	SS	Calc SS	Calc SS	SS Resid	SS Resid	SS Resid		
11				N.FILT.	N.FILT.							
12	CODE	DATE	RAIN	RESID.	RESID.	w/o Del	w/ Del	w/o Del	w/ Del	w/ Del		* Outlie
13	. # .		(in)	(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]	[ ]		
14												
15	404	6/ 2/80	.25	42	23	105	15	-82	8	.55		
16	405	6/ 6/80	.67	44	79	136	64	-57	15	.24		
17	406	6/ 7/80	.60	27	39	130	60	-91	-21	-.35		
18	407	6/28/80	.44	21	22	162	54	-140	-32	-.59		
19	408	7/26/80	1.12	22	57	273	178	-216	-121	-.68		
20	409	8/ 2/80	.26	34	11	180	30	-169	-19	-.63		
21	410	8/ 4/80	4.87	50	1025	969	906	56	119	.13		
22	411	8/ 7/80	.65	41	57	186	73	-129	-16	-.21		
23	412	8/11/80	.64	15	24	185	86	-161	-62	-.72		
24	413	8/16/80	.28	14	9	157	26	-148	-17	-.66		
25	414	8/19/80	.24	27	15	147	20	-132	-5	-.26		
26	415	9/12/80	.95	18	44	242	157	-198	-113	-.72		
27	416	9/16/80	.85	28	62	219	120	-157	-58	-.49		
28	417	9/20/80	.69	27	46	197	90	-151	-44	-.49		
29	418	9/25/80	.15	60	14	143	10	-129	4	.45		
30	419	10/16/80	.30	58	39	194	38	-155	1	.03		
31	420	10/24/80	.24	45	22	173	24	-151	-2	-.10		
32	421	12/ 6/80	.46	59	60	211	73	-151	-13	-.17		
33	424	2/22/81	.76	59	113	237	98	-124	15	.16		
34	425	2/27/81	.22	79	19	185	21	-166	-2	-.09		
35	426	4/ 4/81	.80	300	454	226	133	228	321	2.41		
36	427	4/ 8/81	.36	49	27	173	43	-146	-16	-.37		
37	428	4/ 8/81	.77	40	84	196	106	-112	-22	-.21		
38	429	4/10/81	1.20	294	1205	245	187	960	1018	5.44		*
39	430	4/13/81	.53	69	78	162	63	-84	15	.23		
40	431	4/22/81	.19	65	17	144	14	-127	3	.22		
41	432	5/10/81	.67	49	54	206	87	-152	-33	-.38		
42	433	5/23/81	.29	96	20	197	34	-177	-14	-.42		
43	434	5/29/81	.06	140	9	107	2	-98	7	3.60		
44	435	6/ 8/81	.13	394	49	150	9	-101	40	4.44		
45	436	6/13/81	.53	28	15	200	77	-185	-62	-.81		
46	437	6/15/81	.88	72	162	248	161	-86	1	.01		
47	438	6/20/81	.65	32	50	198	70	-148	-20	-.29		
48	439	7/25/81	.39	35	32	208	64	-176	-32	-.50		
49	440	7/27/81	.28	20	8	194	38	-186	-30	-.79		
50	441	3/12/82	.60	88	116	220	88	-104	28	.31		
51	443	3/15/82	.10	48	4	137	5	-133	-1	-.30		
52	444	3/16/82	.43	56	63	184	54	-121	9	.17		
53	446	3/20/82	.39	2	1	178	44	-177	-43	-.97		
54	447	4/ 2/82	1.89	85	419	369	309	50	110	.36		
55	448	5/11/82	.86	160	332	270	177	62	155	.87		
56	449	5/22/82	.25	13	5	177	26	-172	-21	-.81		
57	450	5/26/82	.26	13	4	174	28	-170	-24	-.84		
58	451	6/15/82	.79	16	31	250	145	-219	-114	-.79		
59												
60	Minimum :		.06	2	1	105	2	-219	-121			
61	Maximum :		4.87	394	1205	969	906	960	1018			
62	Average :		.64	67	114	210	93	-96	21			
63	Std.Dev.:		.73	79	240	125	138	180	168			
64	Count :		44	44	44	44	44	44	44			
65	COV :		1.15	1.18	2.10	.60	1.48					
66	Sum :		27.94	2934	5018	9244	4107	-4226	911			
67					3814		3920		-106			

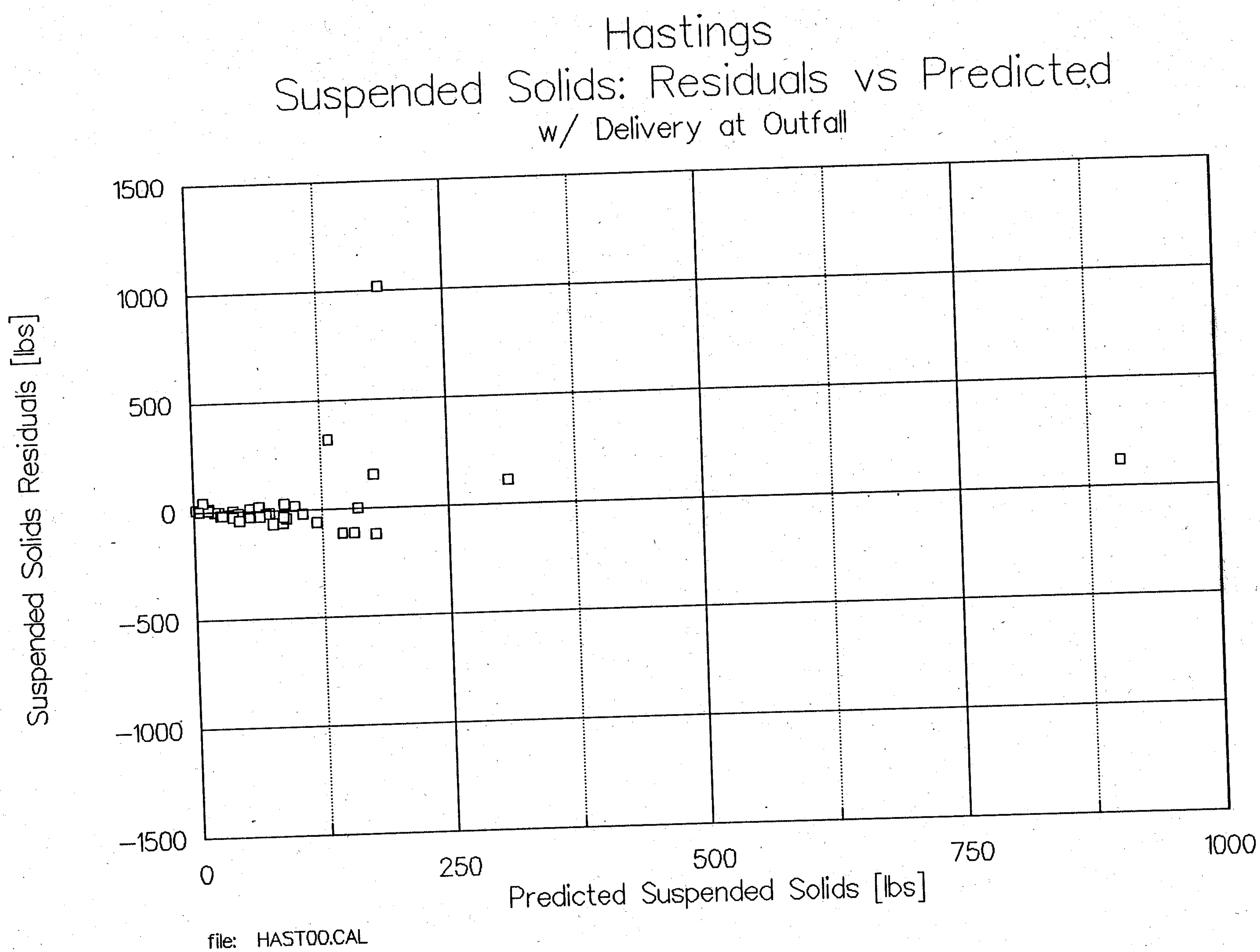
Hastings

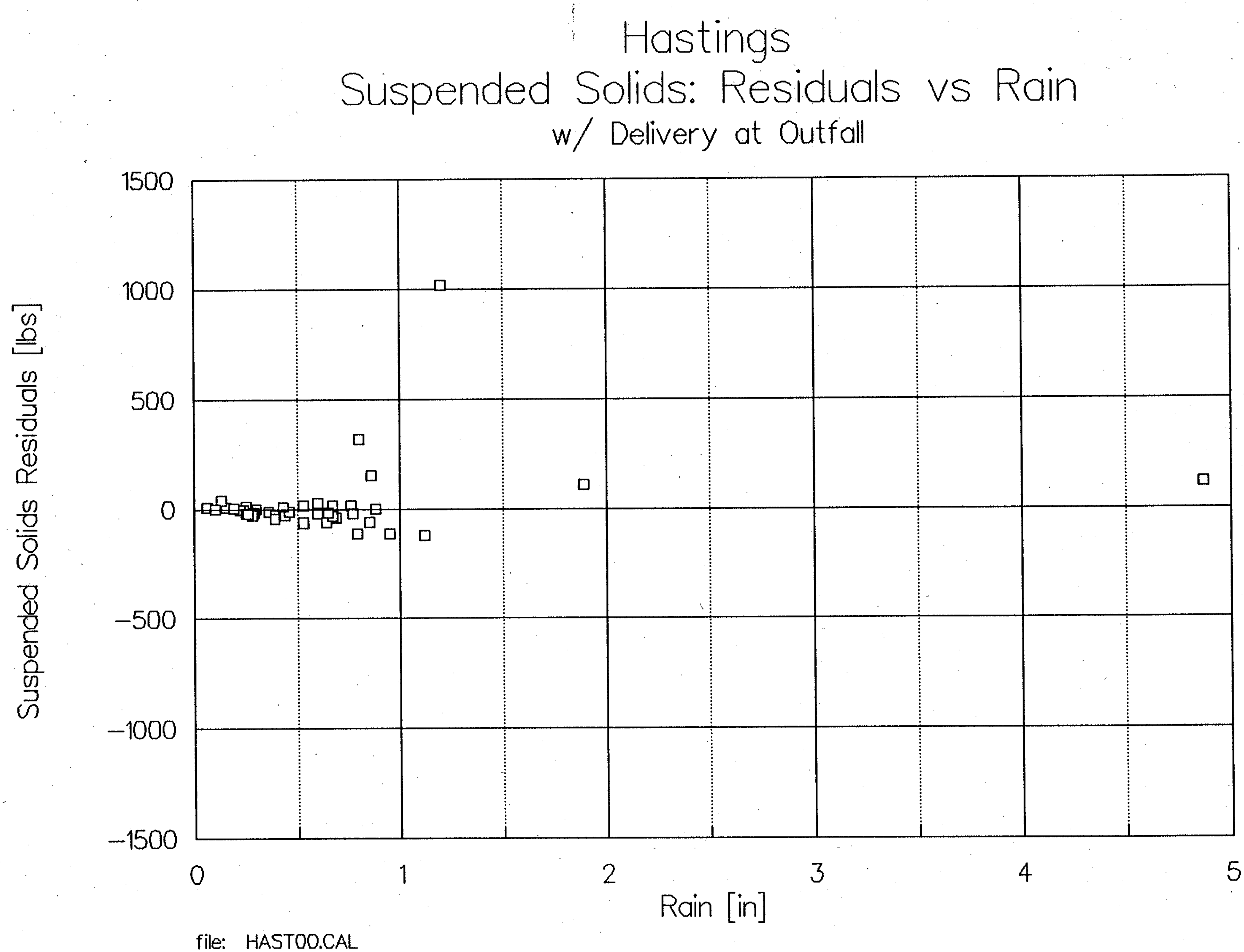
Suspended Solids – Predicted v Observed

w/ Delivery at Outfall



file: HAST00.CAL


Hastings
Suspended Solids: Residuals vs Predicted
w/ Delivery at Outfall
1500
1000
500
0
-500
-1000
-1500
Suspended Solids Residuals [lbs]
0
250
500
750
1000
Predicted Suspended Solids [lbs]
file: HAST00.CAL


Hastings
Suspended Solids: Residuals vs Rain
w/ Delivery at Outfall
Suspended Solids Residuals [lbs]
1500
1000
500
0
−500
−1000
−1500
0
1
2
3
4
5
Rain [in]
file: HAST00.CAL

B5

Burbank Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: BURBØØ.DAT

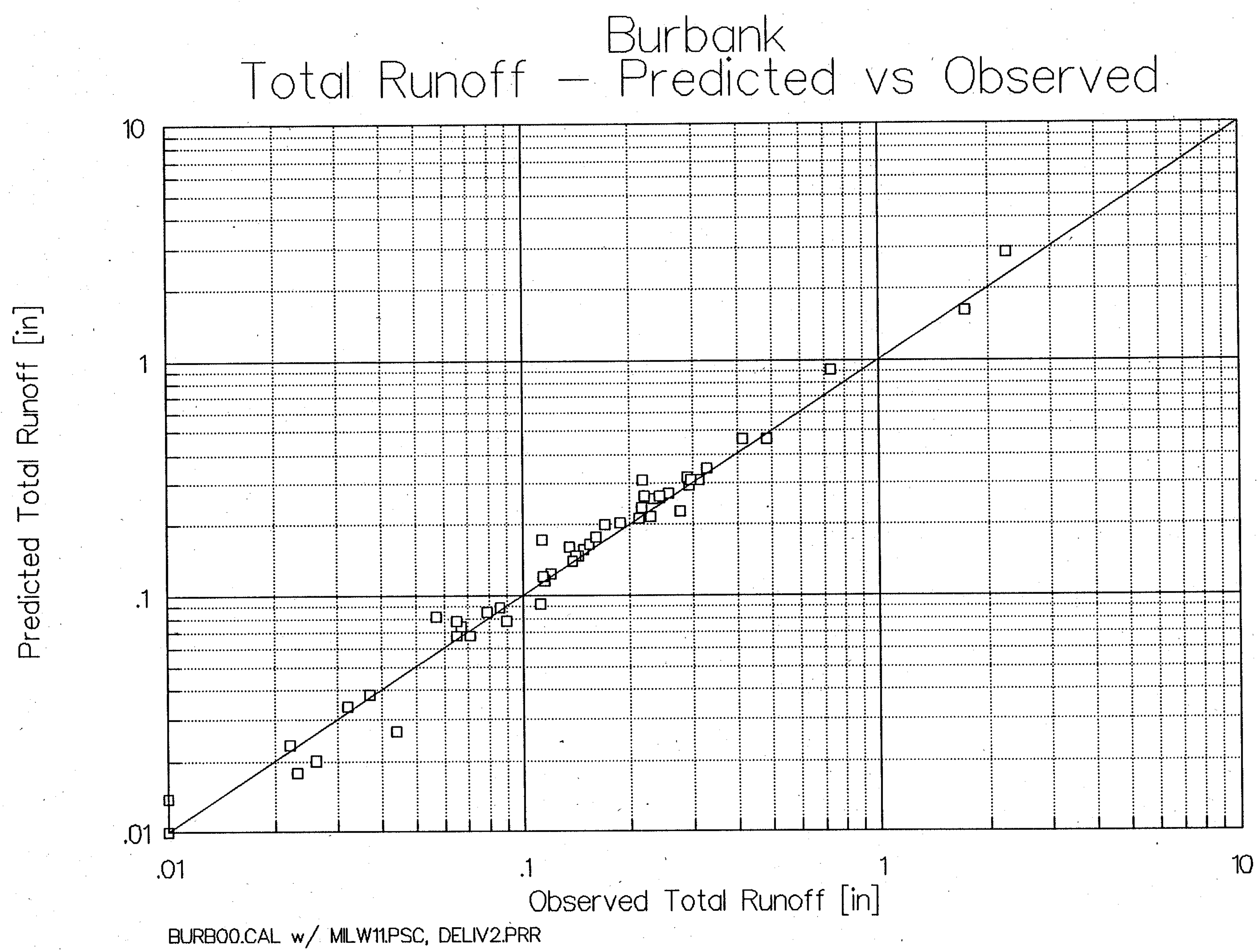
Burbank	Observed	Predicted	Residuals
Runoff [in]			
Average	0.24	0.26	-0.02
Std Dev	0.38	0.44	—
COV	1.59	1.69	—
Sum	12.22	13.36	-1.13
Count	51		
Runoff - outliers [in]			
Average	0.17	0.18	-0.01
Std Dev	0.14	0.16	—
COV	0.82	0.87	—
Sum	7.94	8.58	-0.64
Count	48		
Rv			
Average	0.30	0.31	-0.02
Std Dev	0.09	0.08	—
COV	0.30	0.27	—
SS w/Delivery [lbs]			
Average	391	347	44
Std Dev	764	242	—
COV	1.95	0.70	—
Sum	19942	17676	2266
Count	51		
SS w/Delivery - outliers [lbs]			
Average	220	301	-81
Std Dev	244	102	—
COV	1.11	0.34	—
Sum	10543	14431	-3888
Count	48		

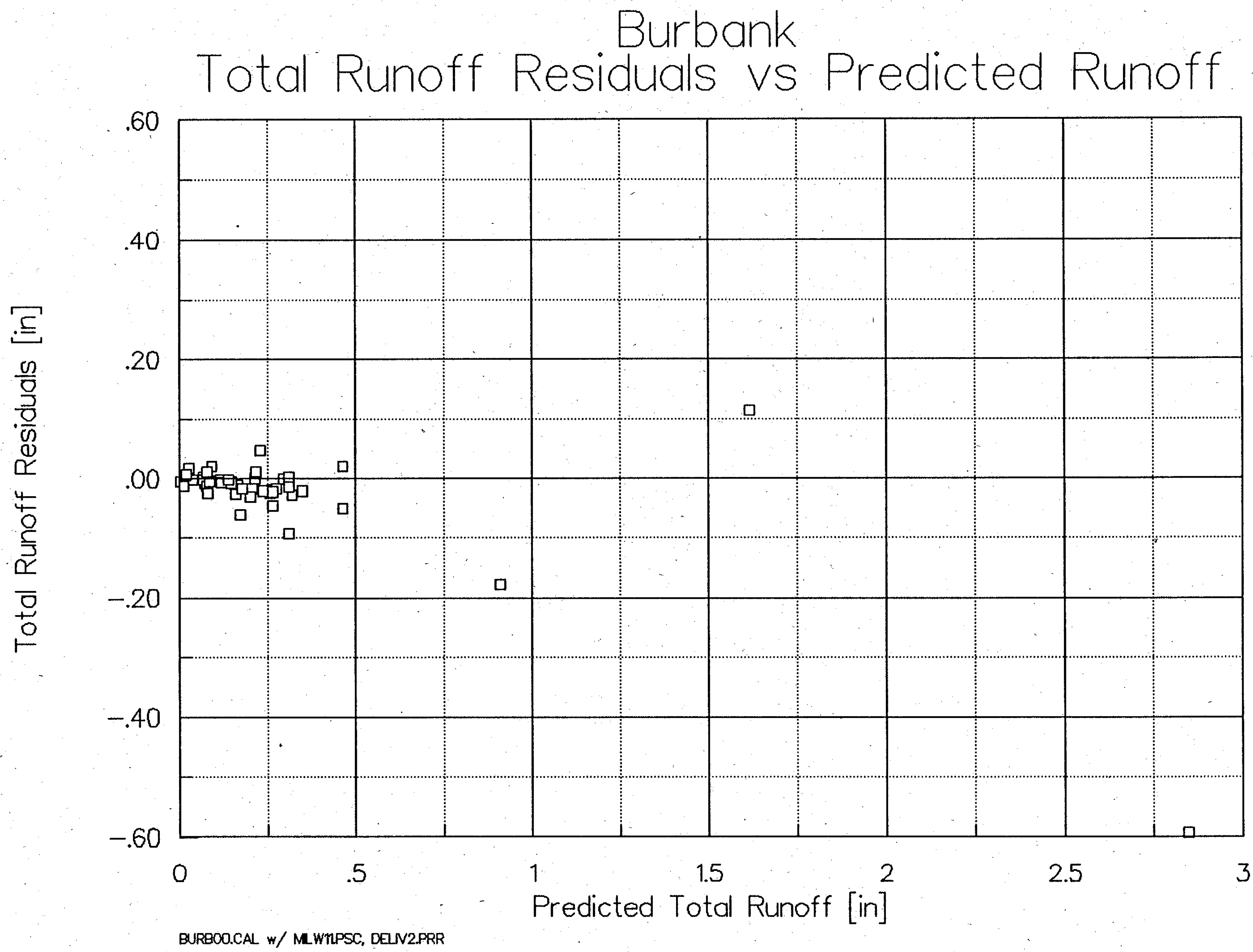
filename: DATASUM.WK1

JGV/RTB

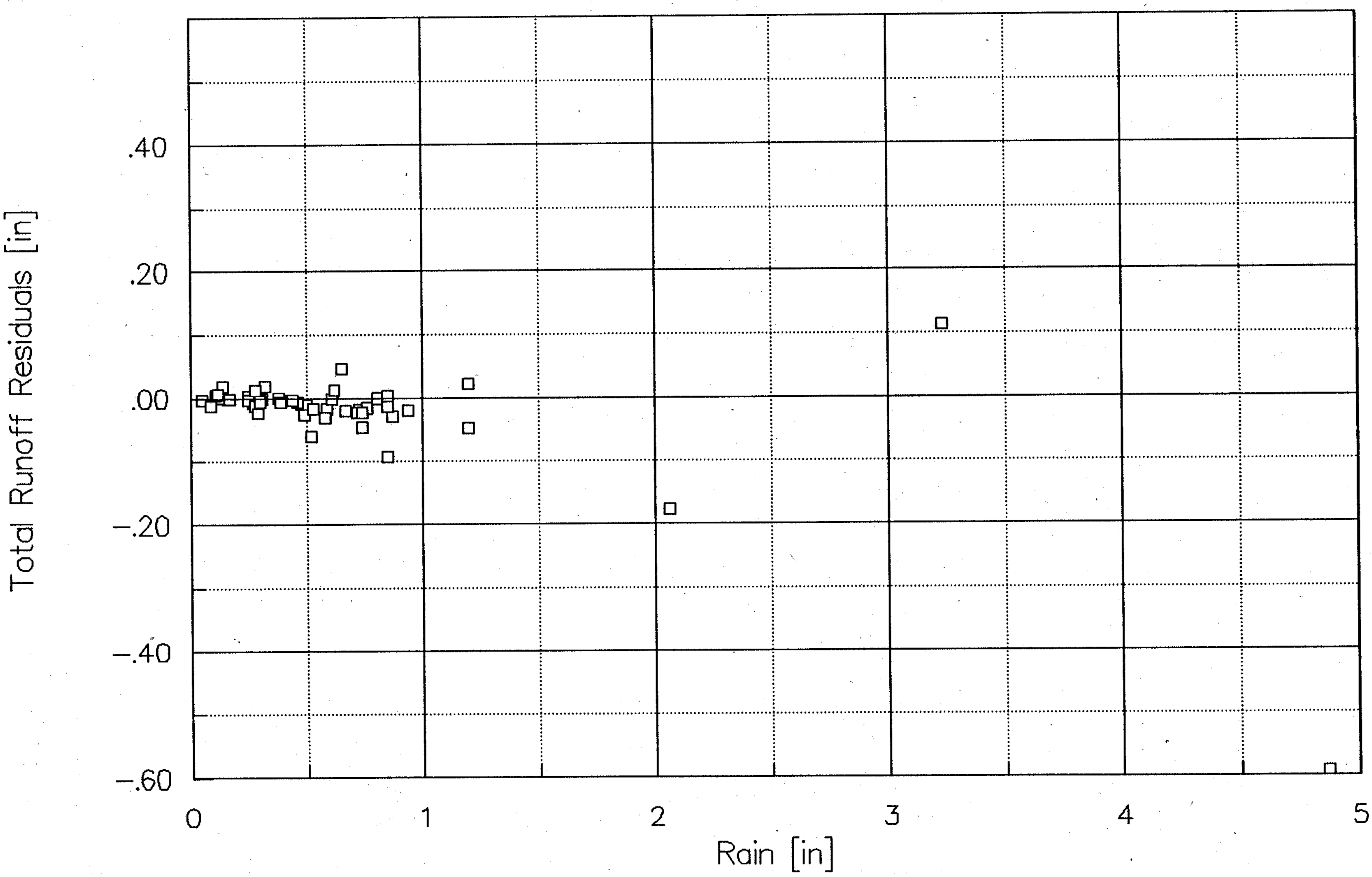
BURBOO.CAL w/ MILW11.PSC, DELIV2.PRR

A	B	C	D	E	F	G	H	I	J	K	L	M
CODE . # .	DATE	RAIN (in)	Obs Ttl Runoff [in]	Obs Ttl Runoff [cu ft]	SLAMM Total Runoff [in]	SLAMM Total Runoff [cu ft]	Resid Total Runoff [in]	Resid Total Runoff [cu ft]		Obs Total Rv (in/in)	SLAMM Total Rv (in/in)	Resid Total Rv (in/in)
350	6/ 6/80	.73	.24	53929	.26	58099	-.02	-4170		.33	.36	-.03
351	6/ 7/80	.65	.28	61505	.23	50940	.05	10565		.42	.35	.07
352	6/28/80	.48	.15	32981	.16	34907	-.01	-1926		.31	.33	-.02
353	7/ 5/80	.94	.33	73093	.35	77678	-.02	-4585		.35	.37	-.02
354	7/ 9/80	.16	.03	7131	.03	7584	.00	-453		.20	.21	-.01
355	7/16/80	.72	.23	51923	.26	57193	-.02	-5270		.32	.36	-.04
356	8/ 2/80	.25	.07	15822	.07	15033	.00	789		.28	.27	.01
357	8/ 4/80	4.87	2.26	502740	2.85	634565	-.59	-131825		.46	.58	-.12
358	8/ 7/80	1.20	.41	92258	.46	103271	-.05	-11013		.35	.39	-.05
360	8/11/80	.85	.22	48358	.31	69150	-.09	-20792		.26	.37	-.11
361	9/16/80	.81	.29	65294	.29	65435	.00	-141		.36	.36	.00
362	9/20/80	.67	.22	48135	.24	52711	-.02	-4576		.32	.35	-.03
363	9/25/80	.13	.02	4903	.02	5177	.00	-274		.17	.18	-.01
364	10/ 3/80	.05	.00	223	.01	1179	.00	-956		.02	.11	-.09
365	11/23/80	.12	.03	5794	.02	4479	.01	1315		.22	.17	.05
366	12/ 6/80	.46	.14	31867	.15	33059	-.01	-1192		.31	.32	-.01
367	12/ 8/80	.27	.07	14931	.07	16567	-.01	-1636		.25	.28	-.03
368	2/22/81	.76	.26	57048	.27	60834	-.02	-3786		.34	.36	-.02
369	4/ 4/81	.74	.24	53929	.26	59007	-.02	-5078		.33	.36	-.03
370	4/ 8/81	.74	.22	48803	.26	59007	-.05	-10204		.30	.36	-.06
371	4/10/81	1.20	.48	107857	.46	103271	.02	4586		.40	.39	.01
372	4/13/81	.52	.11	25182	.17	38707	-.06	-13525		.22	.33	-.11
373	4/22/81	.17	.04	8245	.04	8492	.00	-247		.22	.22	.00
374	5/10/81	.59	.19	41895	.21	45691	-.02	-3796		.32	.35	-.03
376	6/ 8/81	.11	.02	5125	.02	3971	.01	1154		.21	.16	.05
377	6/ 8/81	.14	.04	9805	.03	5927	.02	3878		.31	.19	.12
378	6/13/81	.50	.15	34318	.17	36790	-.01	-2472		.31	.33	-.02
379	6/21/81	.49	.14	30084	.16	35844	-.03	-5760		.28	.33	-.05
380	7/12/81	.87	.29	64625	.32	71025	-.03	-6400		.33	.37	-.04
381	7/12/81	.61	.21	47243	.21	47434	.00	-191		.35	.35	.00
382	7/13/81	3.23	1.73	385746	1.62	360265	.11	25481		.54	.50	.04
383	7/17/81	.40	.12	26741	.12	27723	.00	-982		.30	.31	-.01
384	7/20/81	.46	.14	31421	.15	33059	-.01	-1638		.31	.32	-.01
385	7/25/81	.38	.12	25627	.12	25909	.00	-282		.30	.31	-.01
386	7/27/81	.25	.07	14485	.07	15033	.00	-548		.26	.27	-.01
387	8/ 7/81	.31	.09	19165	.09	19786	.00	-621		.28	.29	-.01
389	8/14/81	.39	.11	25404	.12	26834	-.01	-1430		.29	.31	-.02
390	8/15/81	.32	.11	24959	.09	20623	.02	4336		.35	.29	.06
391	8/28/81	.12	.03	5794	.02	4479	.01	1315		.22	.17	.05
392	8/29/81	.09	.00	223	.01	3080	-.01	-2857		.01	.15	-.14
393	8/31/81	.58	.17	37884	.20	44667	-.03	-6783		.29	.35	-.06
394	9/ 7/81	.53	.16	35878	.18	39679	-.02	-3801		.30	.34	-.04
395	9/25/81	.44	.14	30753	.14	31246	.00	-493		.31	.32	-.01
396	9/26/81	.28	.09	20056	.08	17353	.01	2703		.32	.28	.04
397	9/30/81	2.06	.73	162900	.91	202400	-.18	-39500		.35	.44	-.09
398	10/14/81	.85	.31	69751	.31	69150	.00	601		.37	.37	.00
399	10/17/81	.28	.07	14485	.08	17353	-.01	-2868		.23	.28	-.05
400	10/17/81	.62	.23	51032	.22	48306	.01	2726		.37	.35	.02
401	4/16/82	.30	.08	17605	.09	18963	-.01	-1358		.26	.28	-.02
402	5/11/82	.85	.30	66185	.31	69150	-.01	-2965		.35	.37	-.02
403	5/26/82	.29	.06	12702	.08	18152	-.02	-5450		.20	.28	-.08
Minimum :		.05	.00	223	.01	1179	-.59	-131825		.01	.11	-.14
Maximum :		4.87	2.26	502740	2.85	634565	.11	25481		.54	.58	.12
Average :		.66	.24	53409	.26	58358	-.02	-4949		.30	.31	-.02
Count :		51	51	51	51	51	51	51		51	51	51
Std.Dev. :		.79	.38	85123	.44	98764	.09	19664		.09	.08	.05
Sum :		33.83	12.22	2723843	13.36	2976237	-1.13	-252394		15.06	16.04	-.98
COV :		1.19	1.59	1.59	1.69	1.69				.30	.27	


Burbank
Total Runoff – Predicted vs Observed
Predicted Total Runoff [in]
Observed Total Runoff [in]
10
1
.1
.01
BURB00.CAL w/ MILW11.PSC, DELIV2.PRR


Burbank
Total Runoff Residuals vs Predicted Runoff
Total Runoff Residuals [in]
.60
.40
.20
.00
−.20
−.40
−.60
0
.5
1
1.5
2
2.5
3
Predicted Total Runoff [in]
BURB00.CAL w/ MLW11.PSC, DELIV2.PRR

Burbank
Rain Depth vs Total Runoff Residuals



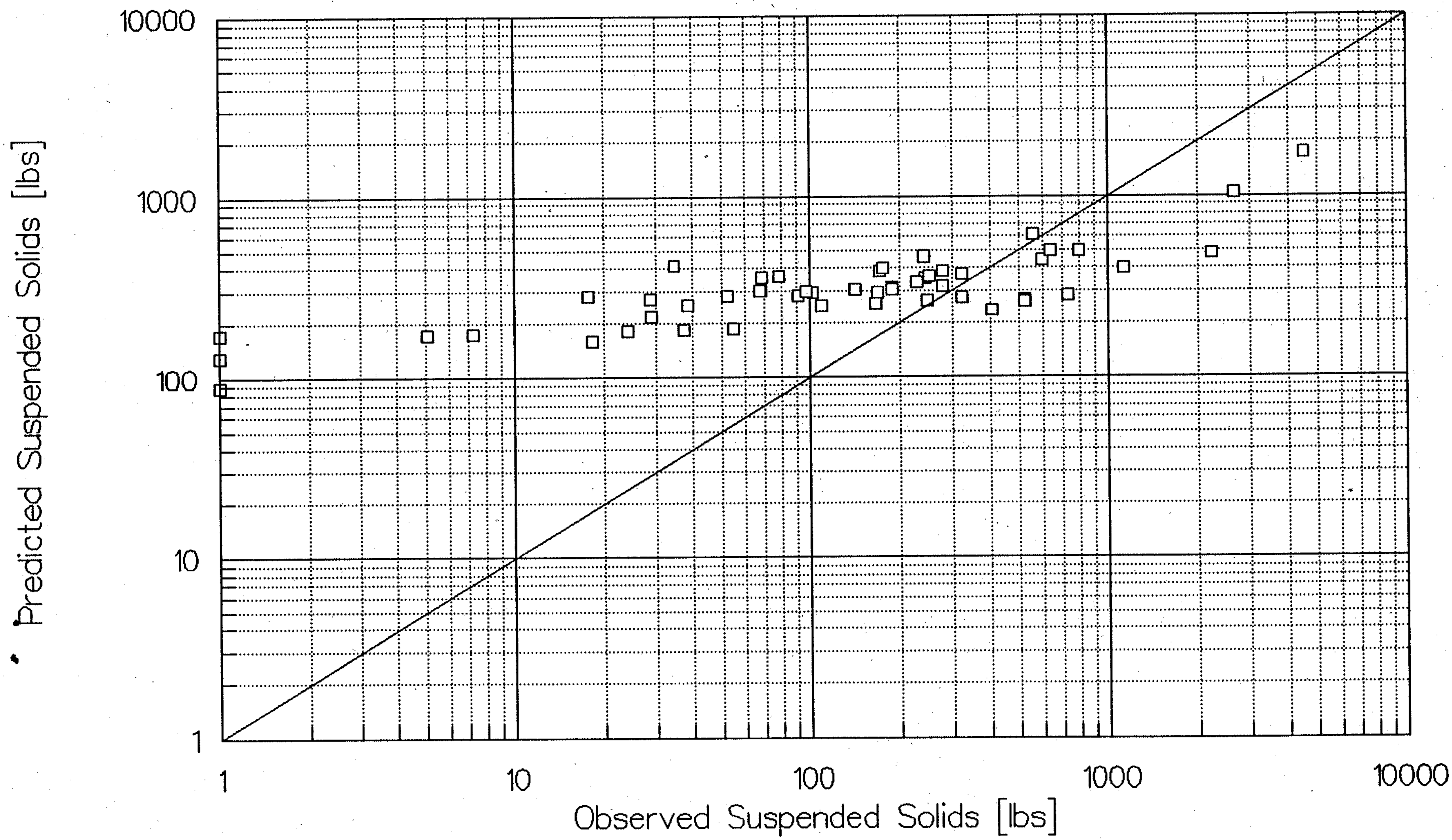
BURBOO.CAL w/ MLW11PSC, DELIV2.PRR

BURB00.CAL w/ MILW11.PSC,

A	B	C	W	X	Y	Z	AA	AB	AD
CODE . # .	DATE	RAIN (in)		SS N.FILT. (lbs)	Calc SS w/o Del [lbs]	Calc SS w/ Del [lbs]	SS Resid w/o Del [lbs]	=SS Resid w/ Del [lbs]	Outliers
350	6/ 6/80	.73		727	301	280	426	447	
351	6/ 7/80	.65		407	258	232	149	175	
352	6/28/80	.48		68	332	301	-264	-233	
353	7/ 5/80	.94		598	471	441	127	157	
354	7/ 9/80	.16		18	252	157	-234	-139	
355	7/16/80	.72		243	385	353	-142	-110	
356	8/ 2/80	.25		142	369	304	-227	-162	
357	8/ 4/80	4.87		4519	1844	1724	2675	2795	*
358	8/ 7/80	1.20		35	475	417	-440	-382	
360	8/11/80	.85		172	417	384	-245	-212	
361	9/16/80	.81		240	494	461	-254	-221	
362	9/20/80	.67		228	404	332	-176	-104	
363	9/25/80	.13		24	282	180	-258	-156	
364	10/ 3/80	.05		1	174	89	-173	-88	
365	11/23/80	.12		1	292	171	-291	-170	
366	12/ 6/80	.46		251	386	361	-135	-110	
367	12/ 8/80	.27		18	348	283	-330	-265	
368	2/22/81	.76		189	439	314	-250	-125	
369	4/ 4/81	.74		1131	446	401	685	730	
370	4/ 8/81	.74		323	426	369	-103	-46	
371	4/10/81	1.20		794	530	496	264	298	
372	4/13/81	.52		102	350	294	-248	-192	
373	4/22/81	.17		29	303	218	-274	-189	
374	5/10/81	.59		29	407	272	-378	-243	
376	6/ 8/81	.11		55	281	185	-226	-130	
377	6/ 8/81	.14		37	291	184	-254	-147	
378	6/13/81	.50		69	392	355	-323	-286	
379	6/21/81	.49		109	378	246	-269	-137	
380	7/12/81	.87		637	533	498	104	139	
381	7/12/81	.61		277	409	383	-132	-106	
382	7/13/81	3.23		2649	1113	1041	1536	1608	*
383	7/17/81	.40		522	287	267	235	255	
384	7/20/81	.46		169	310	289	-141	-120	
385	7/25/81	.38		91	314	278	-223	-187	
386	7/27/81	.25		7	271	173	-264	-166	
387	8/ 7/81	.31		323	321	271	2	52	
389	8/14/81	.39		189	341	304	-152	-115	
390	8/15/81	.32		246	292	263	-46	-17	
391	8/28/81	.12		5	262	171	-257	-166	
392	8/29/81	.09		1	216	129	-215	-128	
393	8/31/81	.58		97	346	296	-249	-199	
394	9/ 7/81	.53		278	356	317	-78	-39	
395	9/25/81	.44		38	383	250	-345	-212	
396	9/26/81	.28		167	338	253	-171	-86	
397	9/30/81	2.06		559	697	610	-138	-51	
398	10/14/81	.85		78	456	359	-378	-281	
399	10/17/81	.28		52	352	283	-300	-231	
400	10/17/81	.62		175	423	395	-248	-220	
401	4/16/82	.30		523	370	261	153	262	
402	5/11/82	.85		2231	514	480	1717	1751	*
403	5/26/82	.29		67	372	301	-305	-234	
Minimum :		.05		1	174	89	-440	-382	
Maximum :		4.87		4519	1844	1724	2675	2795	
Average :		.66		391	412	347	-21	44	
Count :		51		51	51	51	51	51	
Std.Dev. :		.79		764	245	242	555	554	
Sum :		33.83		19942	21003	17676	-1061	2266	
COV :		1.19		1.95	.59	.70			
Sum-Outliers:				10543		14431		-3888	
								-529	

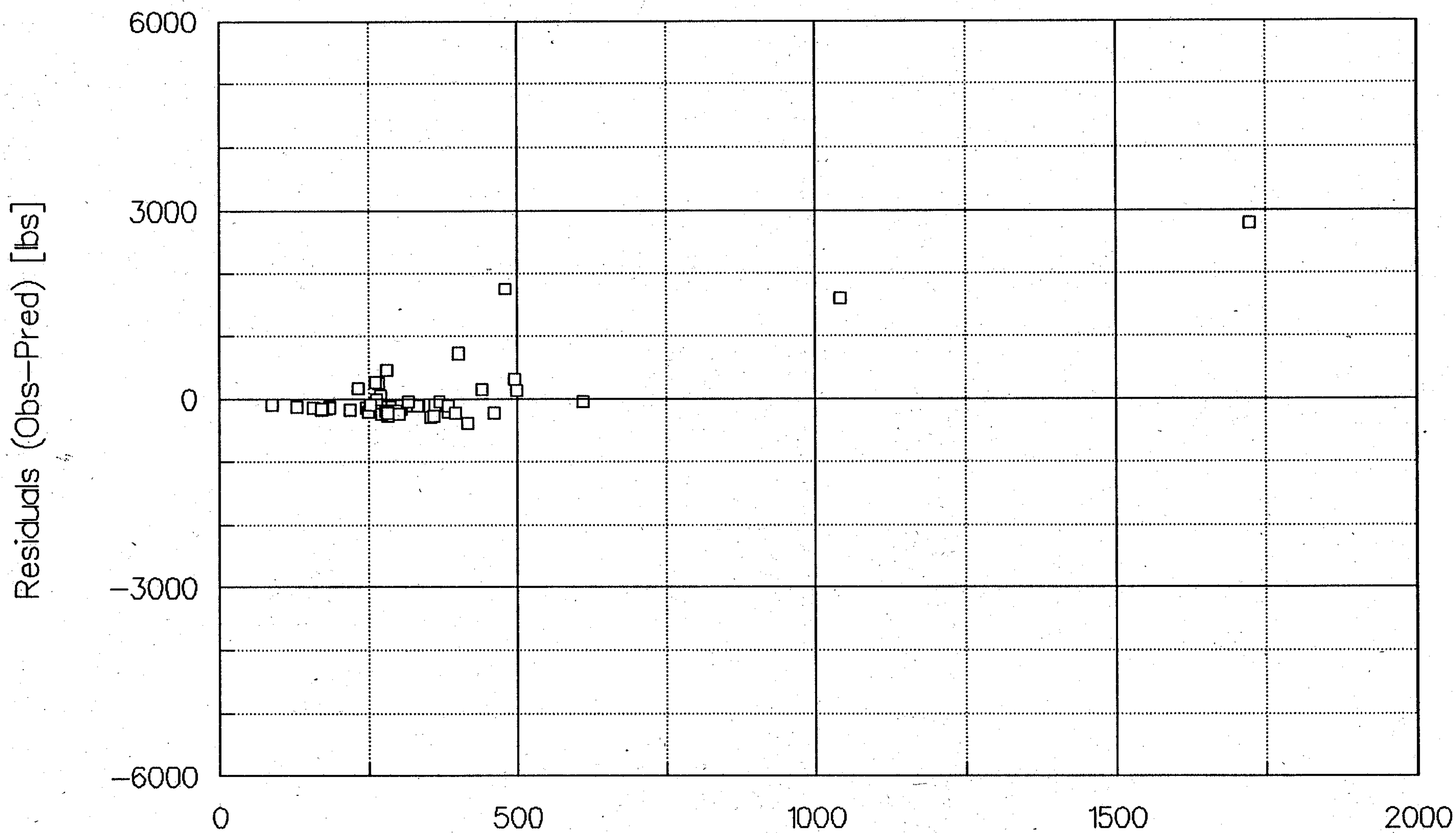
Burbank
Suspended Solids — Predicted vs Observed

w/ Delivery at Outfall



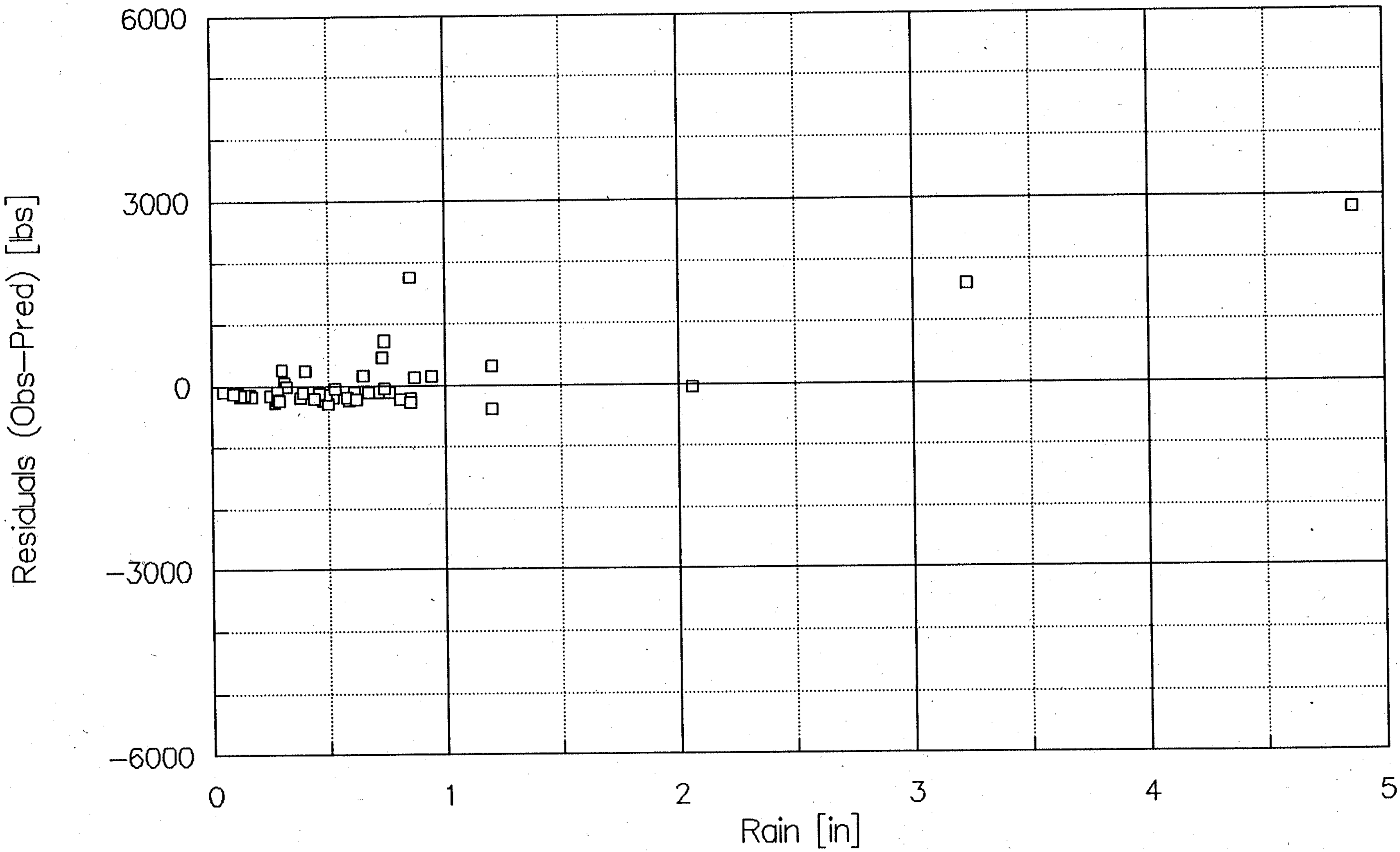
BURB00.CAL w/ MILW11.PSC, DELIV2.PRR
Burbank Calibration Data for DNR

Burbank
Suspended Solids: Residuals vs Predicted Runoff
w/ Delivery at Outfall



BURB00.CAL w/ MILW11.PSC, DELIV2.PRR

Burbank
Suspended Solids: Rain vs Residuals
w/ Delivery at Outfall



BURB00.CAL w/ MILW11.PSC, DELIV2.PRR

B6

State Fair Study Area Results

SLAMM Calibration Data Summary Sheet

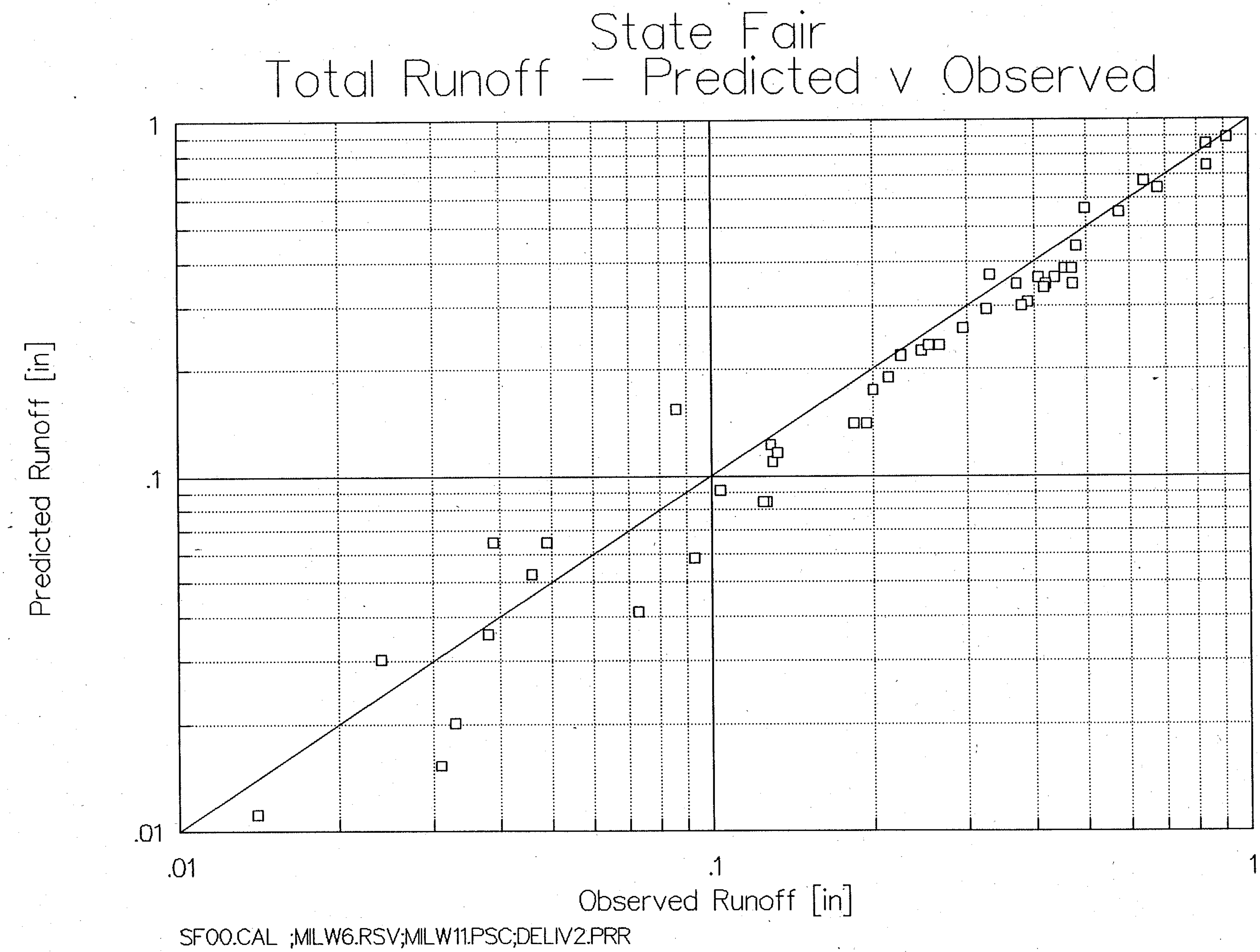
Site Data File Name: SFØØ.DAT

State Fair	Observed	Predicted	Residuals
Runoff [in]			
Average	0.30	0.27	0.03
Std Dev	0.23	0.22	—
COV	0.78	0.83	—
Sum	13.66	12.49	1.18
Count	46		
Runoff - outliers [in]			
Average	0.29	0.27	0.02
Std Dev	0.23	0.23	—
COV	0.79	0.84	—
Sum	13.21	12.11	1.10
Count	45		
Rv			
Average	0.61	0.54	0.07
Std Dev	0.15	0.12	-
COV	0.24	0.22	-
SS w/Delivery [lbs]			
Average	292	280	12
Std Dev	332	108	-
COV	1.14	0.38	—
Sum	13435	12884	551
Count	46		
SS w/Delivery - outliers [lbs]			
Average	257	279	-22
Std Dev	238	109	—
COV	0.93	0.39	—
Sum	11578	12571	-993
Count	45		

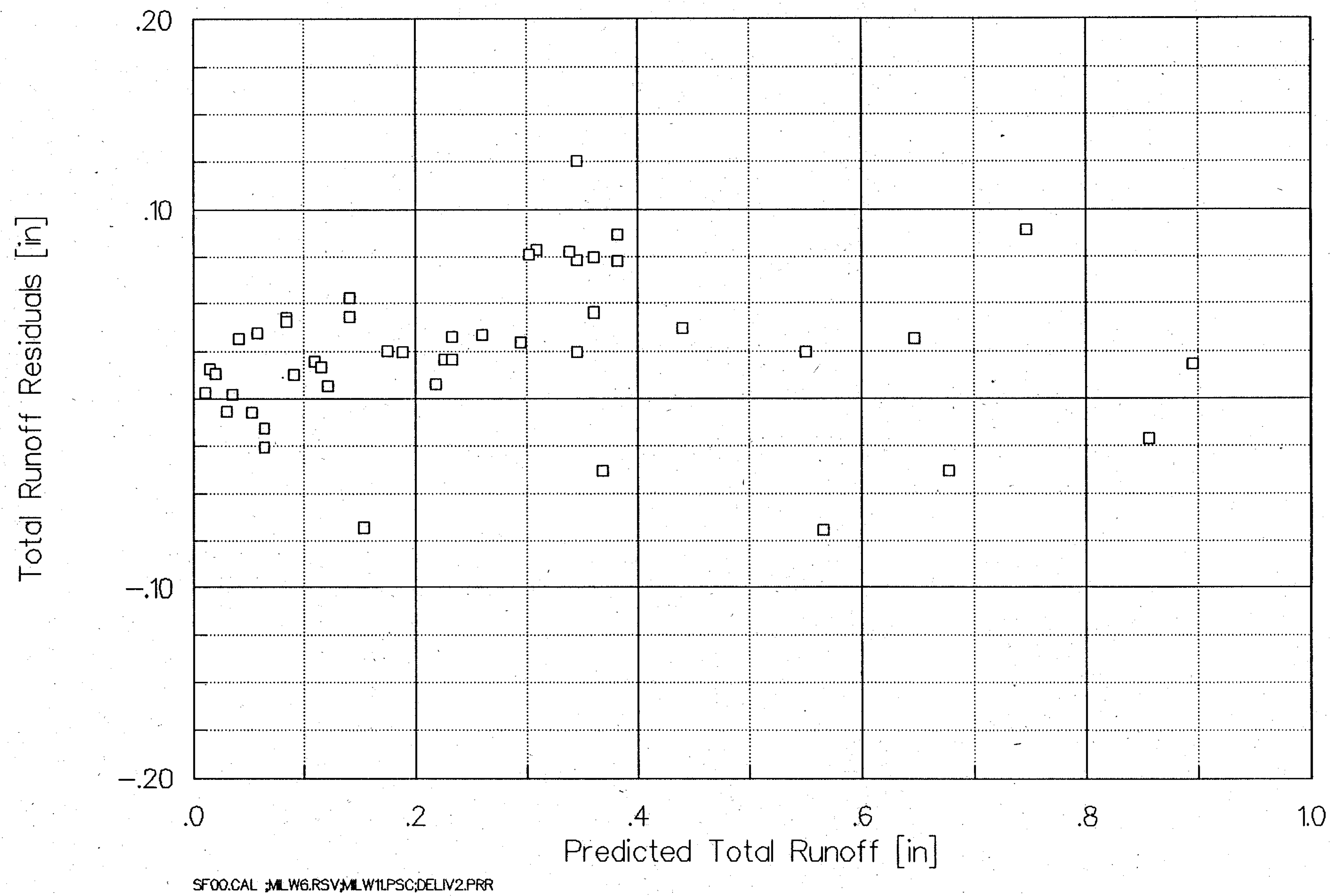
filename: DATASUM.WK1

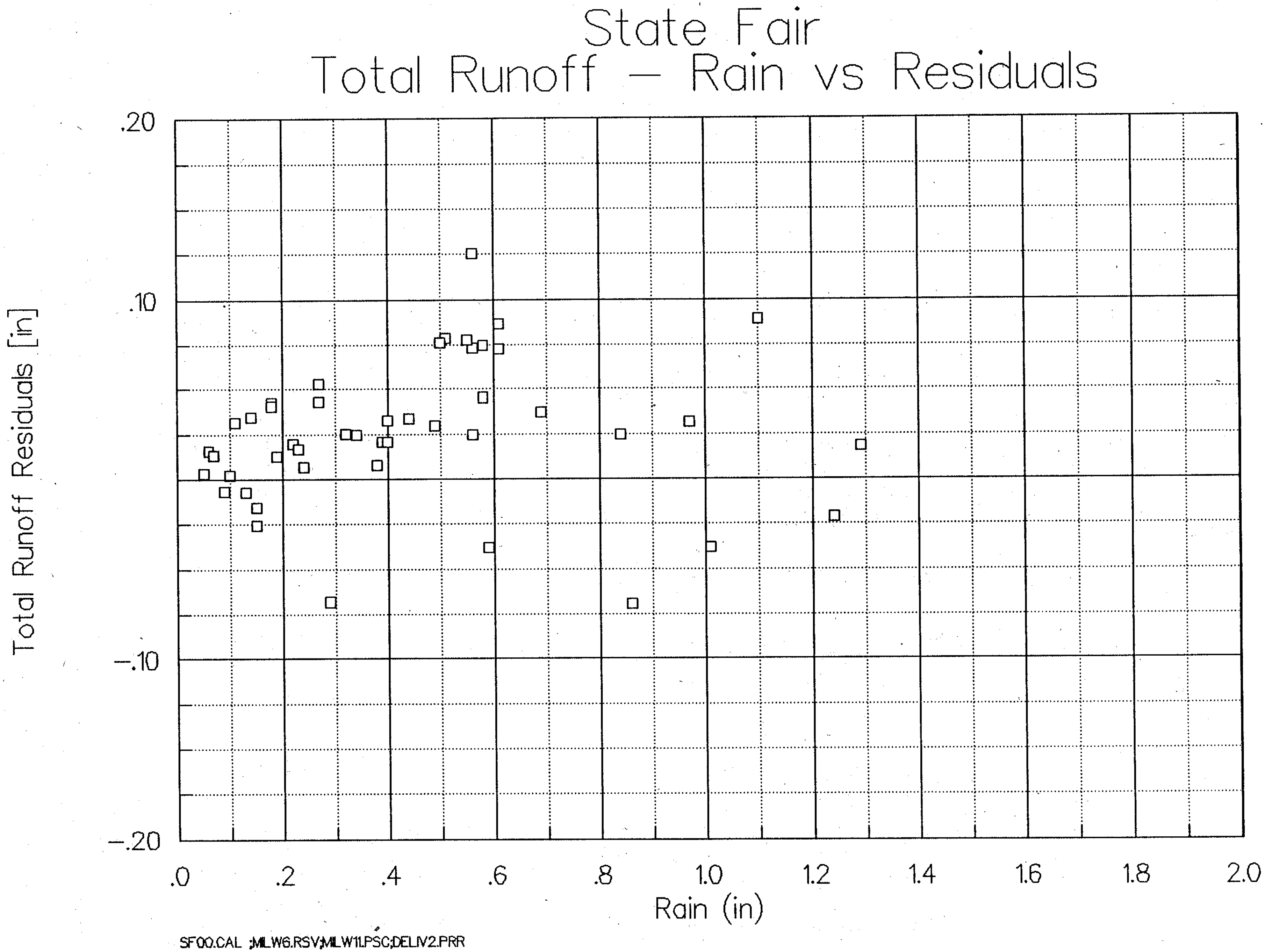
JGU/RTB

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
9														
10	SFOO.CAL ;MILW6.RSV;MILW11.PSC;DE				OBS	SLAMM	SLAMM	RESID	RESID	RESID/		OBS	SLAMM	RESID
11				Obs Ttl	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	OBS TTL		TOTAL	TOTAL	TOTAL
12	CODE	DATE	RAIN	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF		RV	RV	RV
13	. # .		(in)	(in)	(cu ft)	[in]	(cu ft)	[in]	(cu ft)	(%)		(in/in)	(in/in)	(in/in)
14														
15	2	5/28/80	.86	.50	52304	.57	59607	-.07	-7303	-14.0%		.58	.66	-.08
16	3	8/16/80	.34	.21	22567	.19	19929	.03	2638	11.7%		.63	.56	.07
17	4	9/ 9/80	1.24	.84	88052	.86	90294	-.02	-2242	-2.5%		.67	.69	-.02
18	5	9/22/80	.58	.41	42813	.36	38019	.05	4794	11.2%		.70	.62	.08
19	6	9/22/80	.24	.13	13603	.12	12890	.01	713	5.2%		.54	.51	.03
20	7	10/16/80	.69	.48	50300	.44	46395	.04	3905	7.8%		.69	.64	.05
21	10	3/26/81	.06	.03	3269	.02	1609	.02	1660	50.8%		.52	.25	.27
22	11	3/29/81	.07	.03	3480	.02	2120	.01	1360	39.1%		.47	.29	.18
23	12	4/ 4/81	.61	.46	47980	.38	40306	.07	7674	16.0%		.75	.63	.12
24	15	4/13/81	1.29	.91	96277	.89	94354	.02	1923	2.0%		.71	.69	.02
25	16	4/22/81	.22	.13	13709	.11	11602	.02	2107	15.4%		.59	.50	.09
26	17	5/23/81	.18	.13	13392	.08	8896	.04	4496	33.6%		.71	.47	.24
27	18	5/29/81	.27	.18	19403	.14	14896	.04	4507	23.2%		.68	.52	.16
28	19	6/ 8/81	.27	.19	20458	.14	14896	.05	5562	27.2%		.72	.52	.20
29	20	6/13/81	.58	.44	45871	.36	38019	.07	7852	17.1%		.75	.62	.13
30	21	6/21/81	.56	.47	49668	.35	36450	.13	13218	26.6%		.84	.62	.22
31	22	7/17/81	.18	.13	13181	.08	8896	.04	4285	32.5%		.69	.47	.22
32	23	7/20/81	.13	.05	4851	.05	5583	-.01	-732	-15.1%		.35	.41	-.06
33	24	7/27/81	.39	.25	26047	.23	23829	.02	2218	8.5%		.63	.58	.05
34	25	8/ 6/81	.29	.09	9069	.15	16284	-.07	-7215	-79.6%		.30	.53	-.23
35	26	8/14/81	.59	.33	34799	.37	38810	-.04	-4011	-11.5%		.56	.62	-.06
36	28	8/29/81	1.01	.64	67384	.68	71398	-.04	-4014	-6.0%		.63	.67	-.04
37	29	9/21/81	.40	.27	28050	.23	24571	.03	3479	12.4%		.67	.58	.09
38	30	9/25/81	.32	.20	21090	.17	18441	.03	2649	12.6%		.63	.55	.08
39	31	9/26/81	.51	.39	40915	.31	32610	.08	8305	20.3%		.76	.61	.15
40	32	10/17/81	.44	.29	31003	.26	27430	.03	3573	11.5%		.67	.59	.08
41	33	10/17/81	.61	.47	49457	.38	40306	.09	9151	18.5%		.77	.63	.14
42	34	3/30/82	.23	.13	14025	.12	12241	.02	1784	12.7%		.58	.50	.08
43	35	4/ 3/82	.40	.25	26785	.23	24571	.02	2214	8.3%		.64	.58	.06
44	36	4/ 3/82	.56	.42	44184	.35	36450	.07	7734	17.5%		.75	.62	.13
45	37	4/ 3/82	.50	.38	39861	.30	31856	.08	8005	20.1%		.76	.60	.16
46	38	4/ 4/82	1.10	.84	88157	.75	78769	.09	9388	10.6%		.76	.68	.08
47	39	4/16/82	.49	.33	34272	.29	31107	.03	3165	9.2%		.66	.60	.06
48	40	4/16/82	.11	.07	7698	.04	4371	.03	3327	43.2%		.66	.38	.28
49	41	5/11/82	.38	.23	23832	.22	23028	.01	804	3.4%		.59	.57	.02
50	42	5/15/82	.15	.04	4113	.06	6829	-.03	-2716	-66.1%		.26	.43	-.17
51	43	5/18/82	.05	.01	1476	.01	1169		307	20.8%		.28	.22	.06
52	44	5/21/82	.56	.37	39017	.35	36450	.02	2567	6.6%		.66	.62	.04
53	45	5/22/82	.84	.58	60635	.55	58070	.02	2565	4.2%		.68	.66	.02
54	46	5/26/82	.19	.10	10967	.09	9637	.01	1330	12.1%		.55	.48	.07
55	47	5/27/82	.14	.09	9807	.06	6193	.03	3614	36.9%		.66	.42	.24
56	48	5/29/82	.10	.04	4007	.04	3768		239	6.0%		.38	.36	.02
57	49	6/15/82	.97	.68	71496	.65	68192	.03	3304	4.6%		.70	.67	.03
58	50	6/20/82	.15	.05	5167	.06	6829	-.02	-1662	-32.2%		.33	.43	-.10
59	51	6/25/82	.55	.42	43868	.34	35673	.08	8195	18.7%		.76	.62	.14
60	52	6/29/82	.09	.02	2531	.03	3206	-.01	-675	-26.7%		.27	.34	-.07
61														
62	Minimum :		.05	.01	1476	.01	1169	-.07	-7303			.26	.22	-.23
63	Maximum :		1.29	.91	96277	.89	94354	.13	13218			.84	.69	.28
64	Average :		.45	.30	31324	.27	28627	.03	2697	8.6%		.61	.54	.07
65	Std.Dev.:		.32	.23	24366	.22	23664	.04	4171			.15	.12	.11
66	Count :		46	46	46	46	46	46	46			46	46	46
67	COV :		.71	.78	.78	.83	.83					.24	.22	
68	Sum :		20.49	13.66	1440889	12.49	1316849	1.18	124040	0		28.12	24.81	3.31


State Fair
Total Runoff — Predicted v Observed
Predicted Runoff [in]
1
.1
.01
.01
.1
1
Observed Runoff [in]
SF00.CAL ;MILW6.RSV;MILW11.PSC;DELIV2.PRR

State Fair
Total Runoff: Predicted vs Residuals

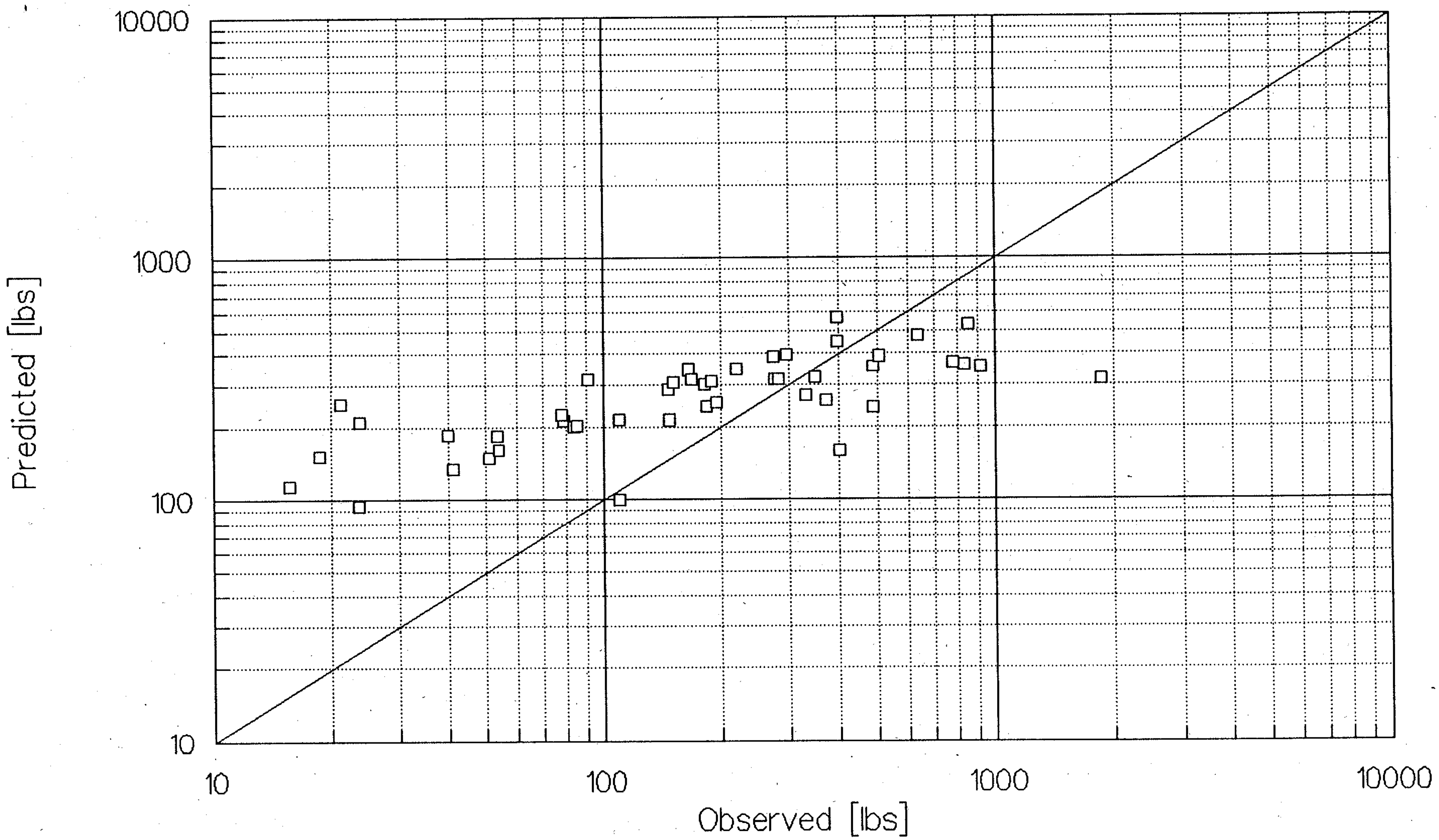




State Fair
Total Runoff – Rain vs Residuals
.20
.10
–.10
–.20
Total Runoff Residuals [in]
.0
.2
.4
.6
.8
1.0
1.2
1.4
1.6
1.8
2.0
Rain (in)
SF00.CAL ;MLW6.RSV;MLW11.PSC;DELIV2.PRR

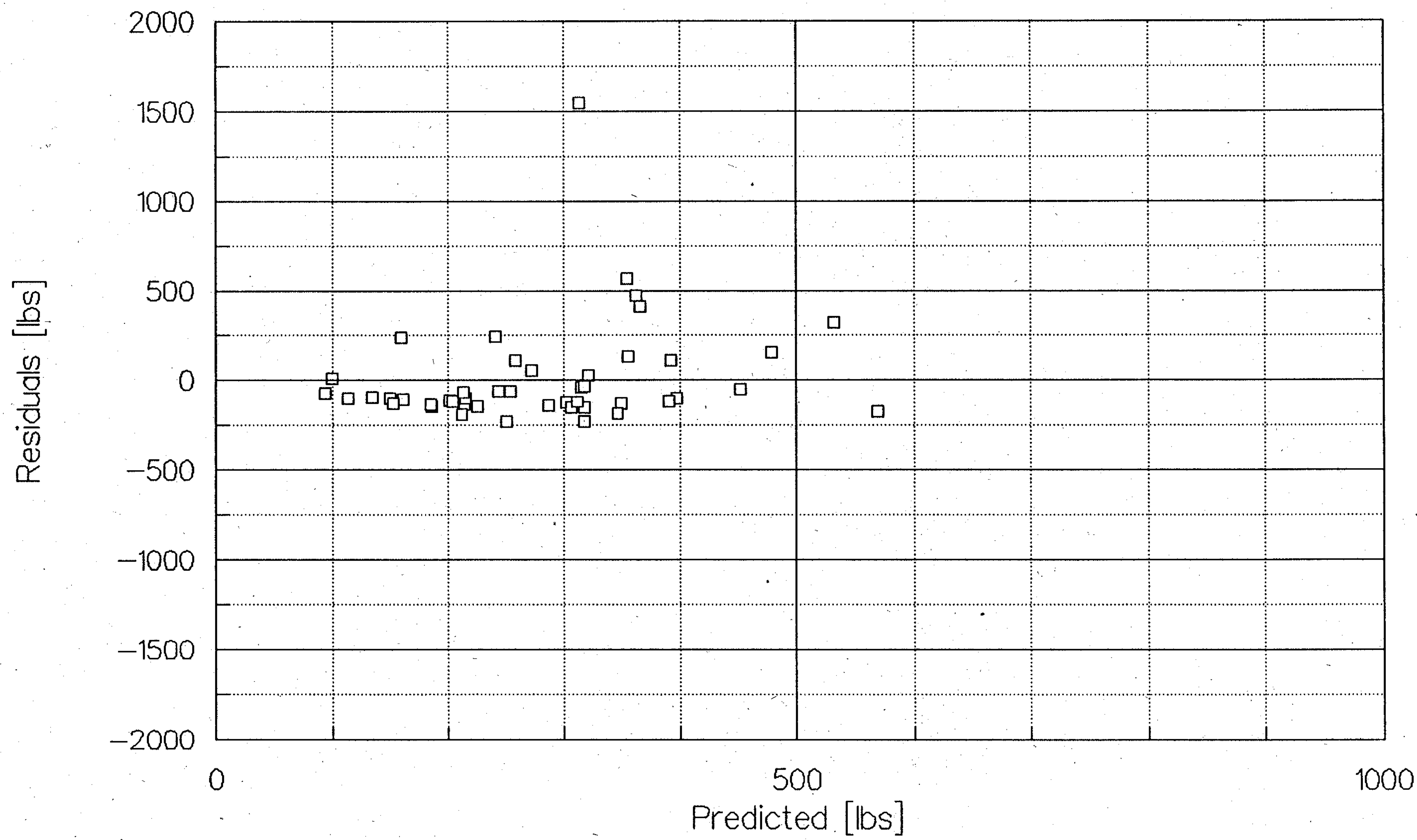
	A	B	C	S	T	U	V	W	X	Y	Z	AA
9												
10	SFOO.CAL ;MILW6.RSV;MILW				SS	SS	Calc SS	Calc SS	SS Resid	SS Resid		
11					N.FILT.	N.FILT.	w/o Del	w/ Del	w/o Del	w/ Del		
12	CODE	DATE	RAIN		RESID.	RESID.						Outliers
13	. # .		(in)		(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]		
14												
15	2	5/28/80	.86		194	633	518	479	115	154		
16	3	8/16/80	.34		56	79	337	214	-258	-135		
17	4	9/ 9/80	1.24		72	396	608	569	-212	-173		
18	5	9/22/80	.58		82	219	397	349	-178	-130		
19	6	9/22/80	.24		92	78	309	225	-231	-147		
20	7	10/16/80	.69		118	371	388	258	-17	113		
21	10	3/26/81	.06		536	109	204	100	-95	9		
22	11	3/29/81	.07		72	16	220	114	-204	-98		
23	12	4/ 4/81	.61		620	1857	358	313	1499	1544		*
24	15	4/13/81	1.29		142	853	575	532	278	321		
25	16	4/22/81	.22		128	110	292	215	-182	-105		
26	17	5/23/81	.18		479	400	291	159	109	241		
27	18	5/29/81	.27		272	329	328	272	1	57		
28	19	6/ 8/81	.27		144	184	342	243	-158	-59		
29	20	6/13/81	.58		51	146	341	286	-195	-140		
30	21	6/21/81	.56		157	487	370	241	117	246		
31	22	7/17/81	.18		102	84	276	201	-192	-117		
32	23	7/20/81	.13		132	40	280	186	-240	-146		
33	24	7/27/81	.39		13	21	362	250	-341	-229		
34	25	8/ 6/81	.29		320	181	357	302	-176	-121		
35	26	8/14/81	.59		160	348	357	321	-9	27		
36	28	8/29/81	1.01		70	294	448	397	-154	-103		
37	29	9/21/81	.40		94	165	392	346	-227	-181		
38	30	9/25/81	.32		18	24	346	212	-322	-188		
39	31	9/26/81	.51		59	151	356	306	-205	-155		
40	32	10/17/81	.44		142	275	359	315	-84	-40		
41	33	10/17/81	.61		158	488	384	355	104	133		
42	34	3/30/82	.23		192	168	414	317	-246	-149		
43	35	4/ 3/82	.40		302	505	428	392	77	113		
44	36	4/ 3/82	.56		102	281	384	317	-103	-36		
45	37	4/ 3/82	.50		76	189	360	311	-171	-122		
46	38	4/ 4/82	1.10		72	396	488	452	-92	-56		
47	39	4/16/82	.49		428	916	393	354	523	562		
48	40	4/16/82	.11		106	51	246	150	-195	-99		
49	41	5/11/82	.38		560	833	412	362	421	471		
50	42	5/15/82	.15		332	85	271	204	-186	-119		
51	43	5/18/82	.05		256	24	187	94	-163	-70		
52	44	5/21/82	.56		80	195	329	254	-134	-59		
53	45	5/22/82	.84		24	91	378	317	-287	-226		
54	46	5/26/82	.19		78	53	257	185	-204	-132		
55	47	5/27/82	.14		88	54	238	161	-184	-107		
56	48	5/29/82	.10		164	41	204	134	-163	-93		
57	49	6/15/82	.97		61	272	472	390	-200	-118		
58	50	6/20/82	.15		456	147	283	213	-136	-66		
59	51	6/25/82	.55		284	778	390	365	388	413		
60	52	6/29/82	.09		118	19	252	152	-233	-133		
61												
62	Minimum :		.05		13.00	16	187	94	-341	-229		
63	Maximum :		1.29		620.00	1857	608	569	1499	1544		
64	Average :		.45		179.61	292	352	280	-60	12		
65	Std.Dev.:		.32		151.93	332	90	108	301	292		
66	Count :		46		46	46	46	46	46	46		
67	COV :		.71		.85	1.14	.26	.38				
68	Sum :		20.49		8262	13435	16181	12884	-2746	551		
69	Sum-outliers:					11578		12571		-993		

State Fair
Suspended Solids: Observed vs Predicted
w/ Delivery at Outfall



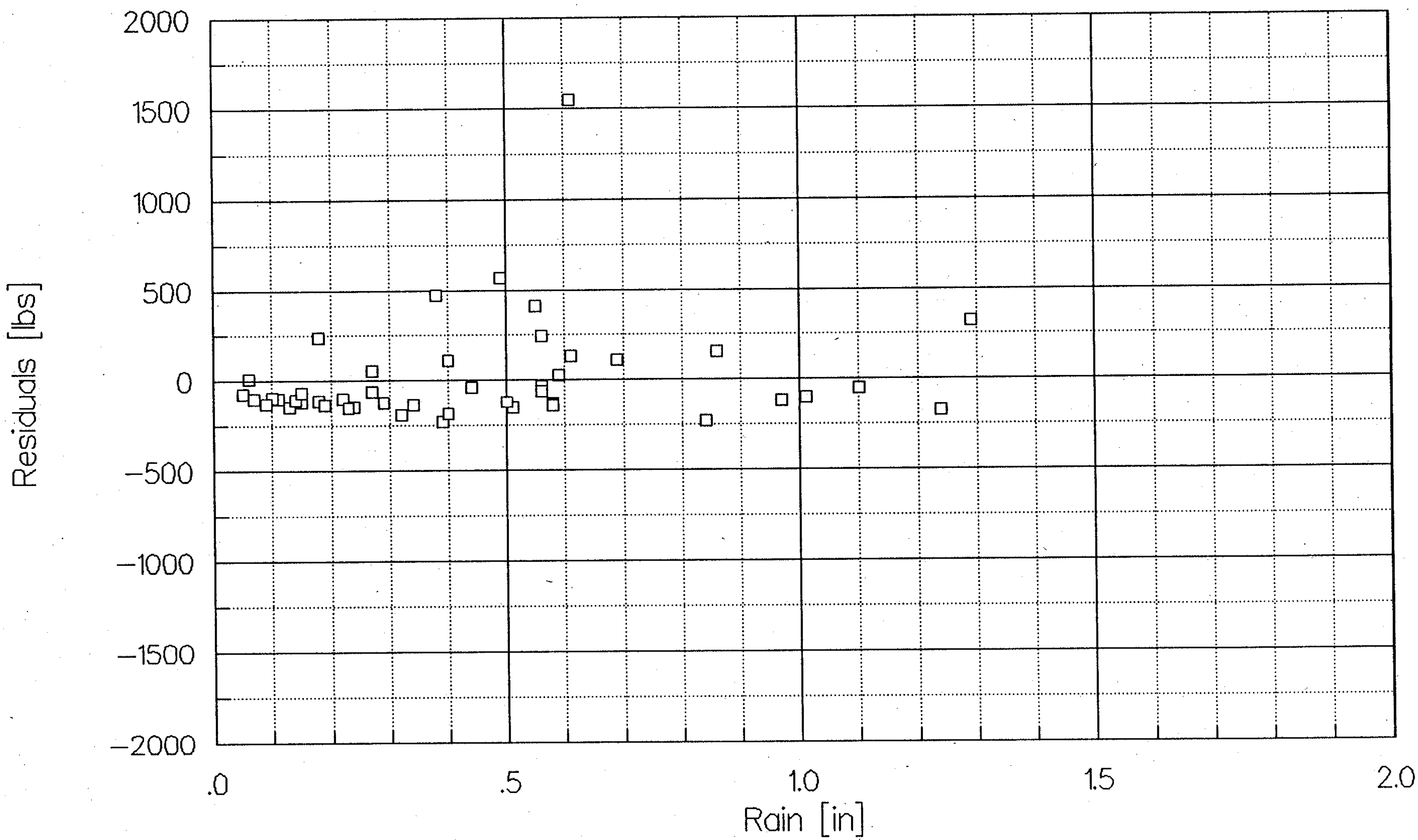
SF00.CAL ;MILW6.RSV;MILW11.PSC;DELIV2.PRR

State Fair
Suspended Solids: Predicted vs Residuals
w/ Delivery at Outfall



SF00.CAL ;MILW6.RSV;MILW11.PSC;DELIV2.PRR
Residuals = Observed−Predicted

State Fair
Suspended Solids: Rain vs Residuals
w/ Delivery at Outfall



SF00.CAL ;MILW6.RSV;MILW11.PSC;DELIV2.PRR
Residuals = Observed--Predicted

B7

Wood Center 1980-1982 Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: WCENØØ.DAT

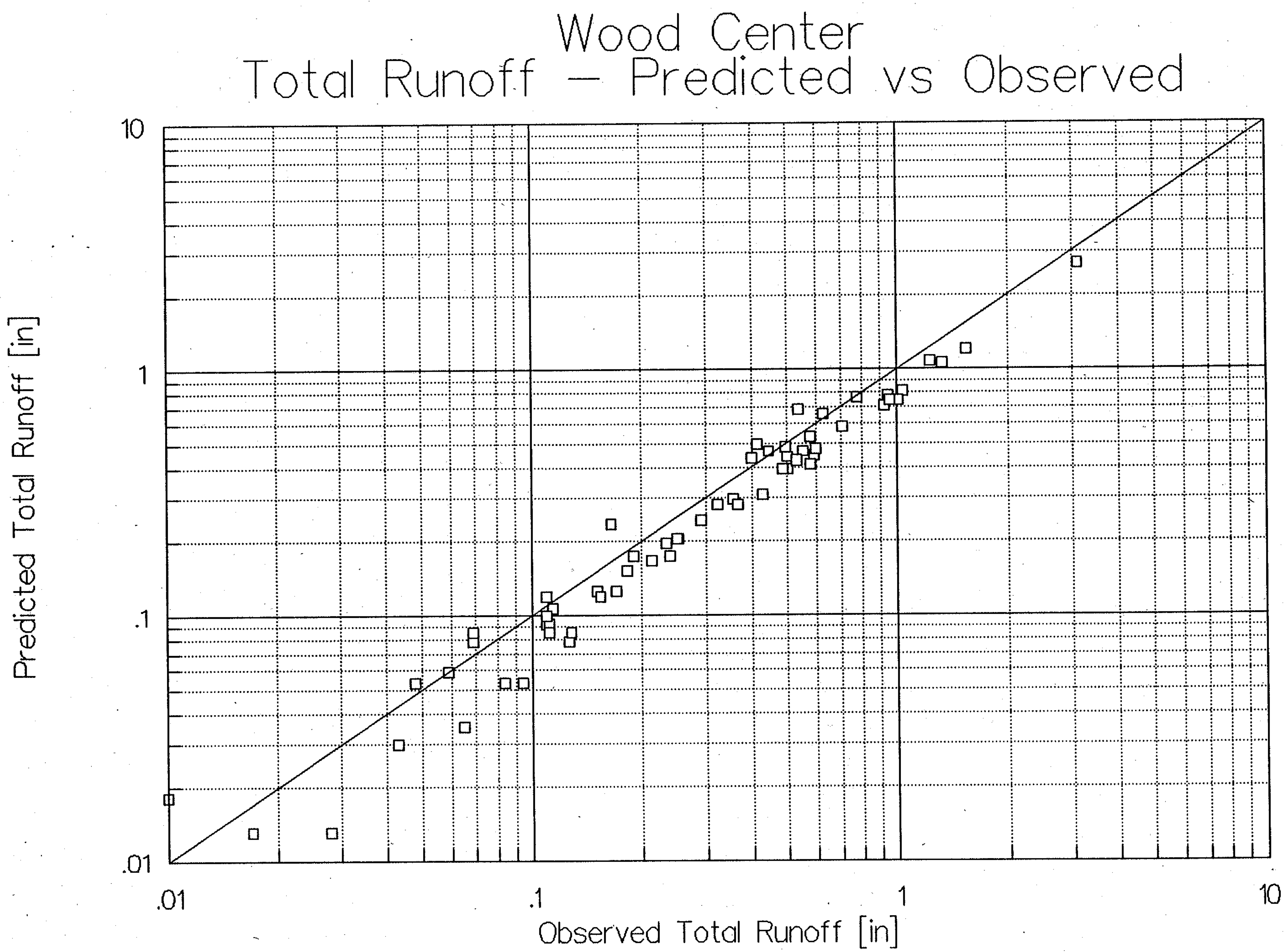
Wood Center	Observed	Predicted	Residuals
Runoff [in]			
Average	0.44	0.38	0.06
Std Dev	0.49	0.42	—
COV	1.12	1.11	—
Sum	26.87	22.94	3.93
Count	61		
Runoff - outliers [in]			
Average	0.38	0.33	0.06
Std Dev	0.34	0.28	—
COV	0.88	0.86	—
Sum	22.44	19.18	3.25
Count	59		
Rv			
Average	0.71	0.60	0.11
Std Dev	0.17	0.13	—
COV	0.24	0.21	—
SS w/Delivery [lbs]			
Average	953	803	150
Std Dev	1330	333	—
COV	1.40	0.41	—
Sum	58156	49005	9151
Count	61		
SS w/Delivery - outliers [lbs]			
Average	780	769	10
Std Dev	909	271	—
COV	1.17	0.35	—
Sum	45996	45391	605
Count	59		

filename: DATASUM.WK1

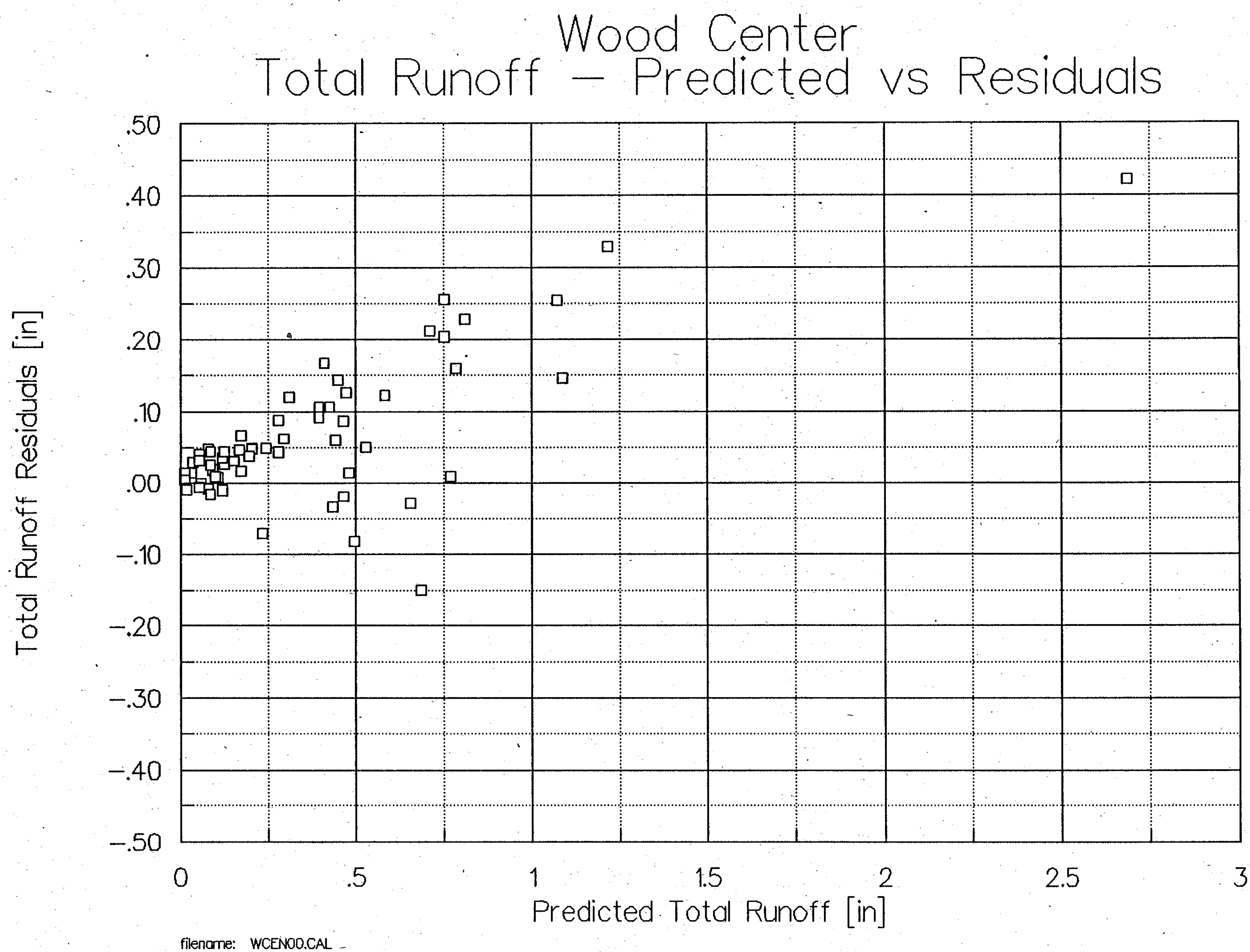
JGV / RTB

filename: WCEN00.CAL

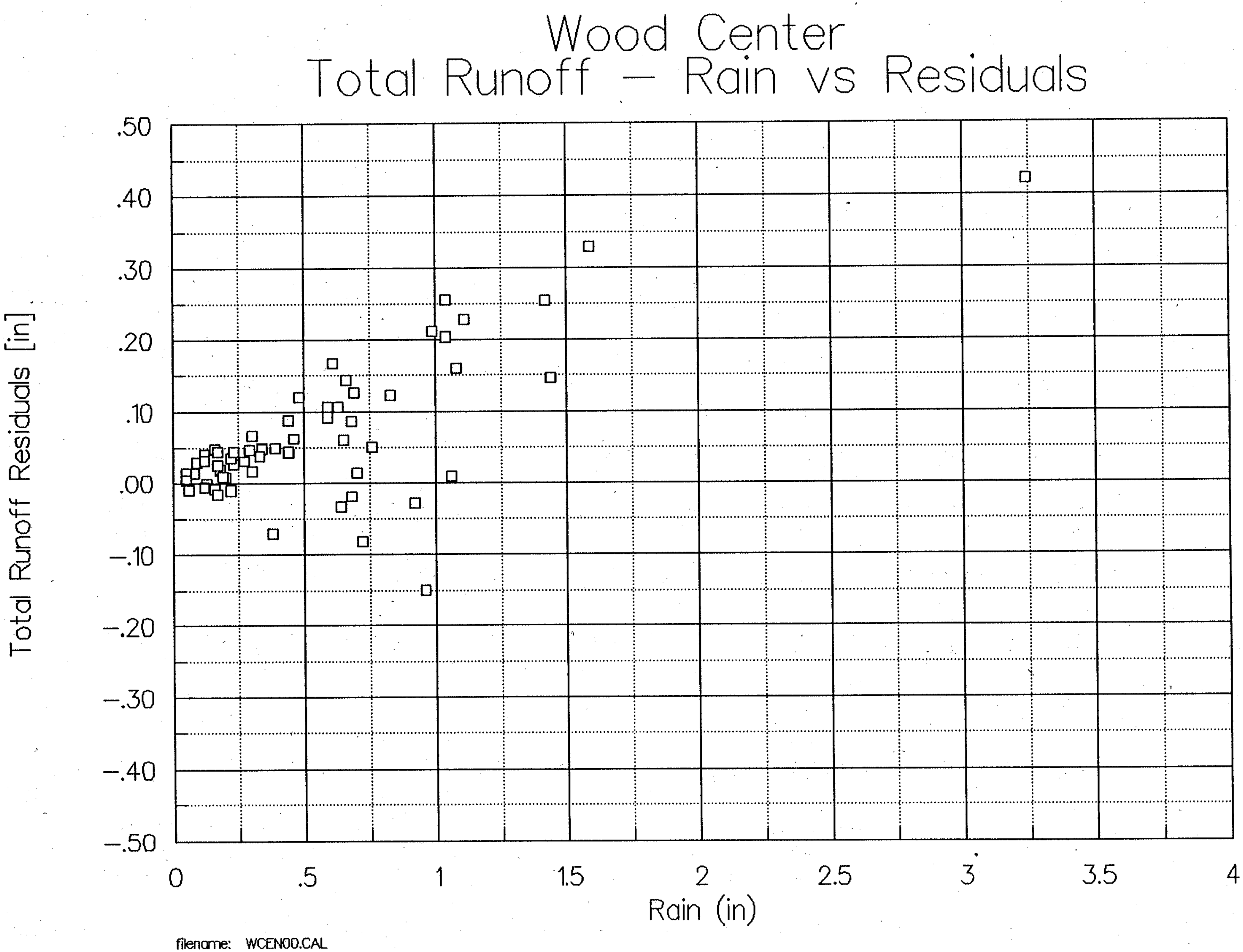
A	B	C	D	E	F	G	H	I	J	K	L	M	N
CODE . # .	DATE	RAIN (in)	Obs Ttl RUNOFF (in)	Obs Ttl RUNOFF (cu ft)	SLAMM TOTAL RUNOFF [in]	SLAMM TOTAL RUNOFF (cu ft)	RESID TOTAL RUNOFF [in]	RESID TOTAL RUNOFF (cu ft)	RESID/ OBS TTL RUNOFF (%)		OBS TOTAL RV (in/in)	SLAMM TOTAL RV (in/in)	RESID TOTAL RV (in/in)
53	3/15/80	.23	.15	24151	.13	20055	.03	4096	17.0%		.66	.55	.11
54	4/ 3/80	.16	.13	20152	.08	12507	.05	7645	37.9%		.79	.49	.30
55	4/ 4/80	.34	.25	40304	.20	32515	.05	7789	19.3%		.74	.60	.14
56	4/ 6/80	.08	.04	6877	.03	4776	.01	2101	30.6%		.54	.37	.17
57	4/ 9/80	.29	.21	34067	.17	26607	.05	7460	21.9%		.73	.57	.16
60	5/28/80	.76	.58	92444	.53	84382	.05	8062	8.7%		.76	.69	.07
61	6/ 1/80	.30	.24	38385	.17	27755	.07	10630	27.7%		.80	.58	.22
62	6/ 2/80	.59	.50	80129	.39	63164	.11	16965	21.2%		.85	.67	.18
63	6/ 5/80	1.11	1.04	166175	.81	129681	.23	36494	22.0%		.94	.73	.21
64	6/ 6/80	.66	.59	94683	.45	71736	.14	22947	24.2%		.90	.68	.22
65	6/ 7/80	1.04	1.01	161217	.75	120273	.26	40944	25.4%		.97	.72	.25
66	6/19/80	.20	.11	18233	.11	16994	.01	1239	6.8%		.57	.53	.04
67	7/ 5/80	.70	.49	79009	.48	76736	.01	2273	2.9%		.71	.69	.02
68	7/ 9/80	.72	.41	66054	.50	79265	-.08	-13211	-20.0%		.57	.69	-.12
69	7/15/80	.13	.06	9436	.06	9470	.00	-34	-.4%		.45	.46	-.01
70	7/16/80	.06	.01	1439	.02	2884	-.01	-1445	-100.4%		.15	.30	-.15
71	7/26/80	1.59	1.55	247264	1.22	194704	.33	52560	21.3%		.97	.77	.20
72	8/ 2/80	.18	.11	17433	.09	14711	.02	2722	15.6%		.61	.51	.10
73	8/ 2/80	.17	.13	20472	.08	13591	.04	6881	33.6%		.75	.50	.25
74	8/ 4/80	3.24	3.11	497247	2.69	429714	.42	67533	13.6%		.96	.83	.13
75	8/ 7/80	1.44	1.23	197203	1.09	174012	.15	23191	11.8%		.86	.76	.10
76	8/ 7/80	.48	.43	68453	.31	49446	.12	19007	27.8%		.89	.64	.25
78	8/16/80	.34	.25	40144	.20	32515	.05	7629	19.0%		.74	.60	.14
80	4/ 8/81	1.08	.95	151141	.79	125628	.16	25513	16.9%		.88	.73	.15
81	4/13/81	1.42	1.33	211918	1.07	171287	.25	40631	19.2%		.93	.75	.18
82	4/22/81	.22	.15	24630	.12	19019	.04	5611	22.8%		.70	.54	.16
83	5/23/81	.23	.17	27189	.13	20055	.04	7134	26.2%		.74	.55	.19
84	5/29/81	.27	.18	29269	.15	24358	.03	4911	16.8%		.68	.56	.12
85	6/ 8/81	.30	.19	30388	.17	27755	.02	2633	8.7%		.63	.58	.05
86	6/13/81	.59	.49	77890	.39	63164	.09	14726	18.9%		.83	.67	.16
88	6/20/81	.16	.07	11036	.08	12507	-.01	-1471	-13.3%		.43	.49	-.06
89	7/12/81	.44	.32	51660	.28	44688	.04	6972	13.5%		.73	.64	.09
90	7/17/81	.18	.11	17753	.09	14711	.02	3042	17.1%		.62	.51	.11
91	7/20/81	.05	.03	4478	.01	2104	.01	2374	53.0%		.56	.26	.30
92	7/27/81	.39	.29	46702	.24	38845	.05	7857	16.8%		.75	.62	.13
93	8/14/81	.65	.50	80129	.44	70497	.06	9632	12.0%		.77	.68	.09
94	8/15/81	.33	.23	37425	.20	31300	.04	6125	16.4%		.71	.59	.12
95	8/26/81	.68	.55	88126	.46	74226	.09	13900	15.8%		.81	.68	.13
96	8/29/81	.99	.92	147623	.71	113655	.21	33968	23.0%		.93	.72	.21
97	8/31/81	1.04	.96	152901	.75	120273	.20	32628	21.3%		.92	.72	.20
98	9/ 7/81	.63	.53	85087	.43	68035	.11	17052	20.0%		.84	.68	.16
99	9/21/81	.46	.36	56938	.29	47052	.06	9886	17.4%		.77	.64	.13
100	10/ 6/81	.69	.60	95643	.47	75479	.13	20164	21.1%		.87	.68	.19
101	10/17/81	.44	.37	58697	.28	44688	.09	14009	23.9%		.83	.64	.19
102	10/17/81	.61	.58	92444	.41	65592	.17	26852	29.0%		.95	.67	.28
103	4/ 2/82	.83	.71	112916	.58	93231	.12	19685	17.4%		.85	.70	.15
104	4/ 2/82	.09	.07	10396	.04	5633	.03	4763	45.8%		.72	.39	.33
105	4/ 2/82	1.06	.78	124272	.77	122944	.01	1328	1.1%		.73	.73	.00
106	4/ 3/82	.22	.11	17433	.12	19019	-.01	-1586	-9.1%		.50	.54	-.04
107	4/16/82	.64	.40	63975	.43	69264	-.03	-5289	-8.3%		.63	.68	-.06
108	4/16/82	.12	.09	15034	.05	8529	.04	6505	43.3%		.78	.44	.34
109	5/11/82	.38	.17	26390	.23	37545	-.07	-11155	-42.3%		.43	.62	-.19
110	5/15/82	.17	.11	17753	.08	13591	.03	4162	23.4%		.65	.50	.15
111	5/18/82	.05	.02	2719	.01	2104	.00	615	22.6%		.34	.26	.08
113	5/22/82	.96	.54	85727	.69	109758	-.15	-24031	-28.0%		.56	.71	-.15
114	5/26/82	.17	.07	11036	.08	13591	-.02	-2555	-23.2%		.41	.50	-.09
115	5/27/82	.12	.08	13435	.05	8529	.03	4906	36.5%		.70	.44	.26
116	5/29/82	.12	.05	7677	.05	8529	-.01	-852	-11.1%		.40	.44	-.04
117	6/15/82	.92	.63	100121	.65	104616	-.03	-4495	-4.5%		.68	.71	-.03
118	6/20/82	.19	.11	17433	.10	15868	.01	1565	9.0%		.57	.52	.05
119	6/25/82	.68	.45	71172	.46	74226	-.02	-3054	-4.3%		.65	.68	-.03
Minimum :		.05	.01	1439	.01	2104	-.15	-24031			.15	.26	-.19
Maximum :		3.24	3.11	497247	2.69	429714	.42	67533			.97	.83	.34
Average :		.55	.44	70451	.38	60154	.06	10297	14.6%		.71	.60	.11
Std.Dev.:		.51	.49	78623	.42	66750	.10	15433			.17	.13	.12
Count :		61	61	61	61	61	61	61			61	61	61
COV :		.94	1.12	1.12	1.11	1.11					.24	.21	
Sum :		33.38	26.87	4297529	22.94	3669388	3.93	628141	14.6%		43.39	36.39	7.00



filename: WCEN00.CAL



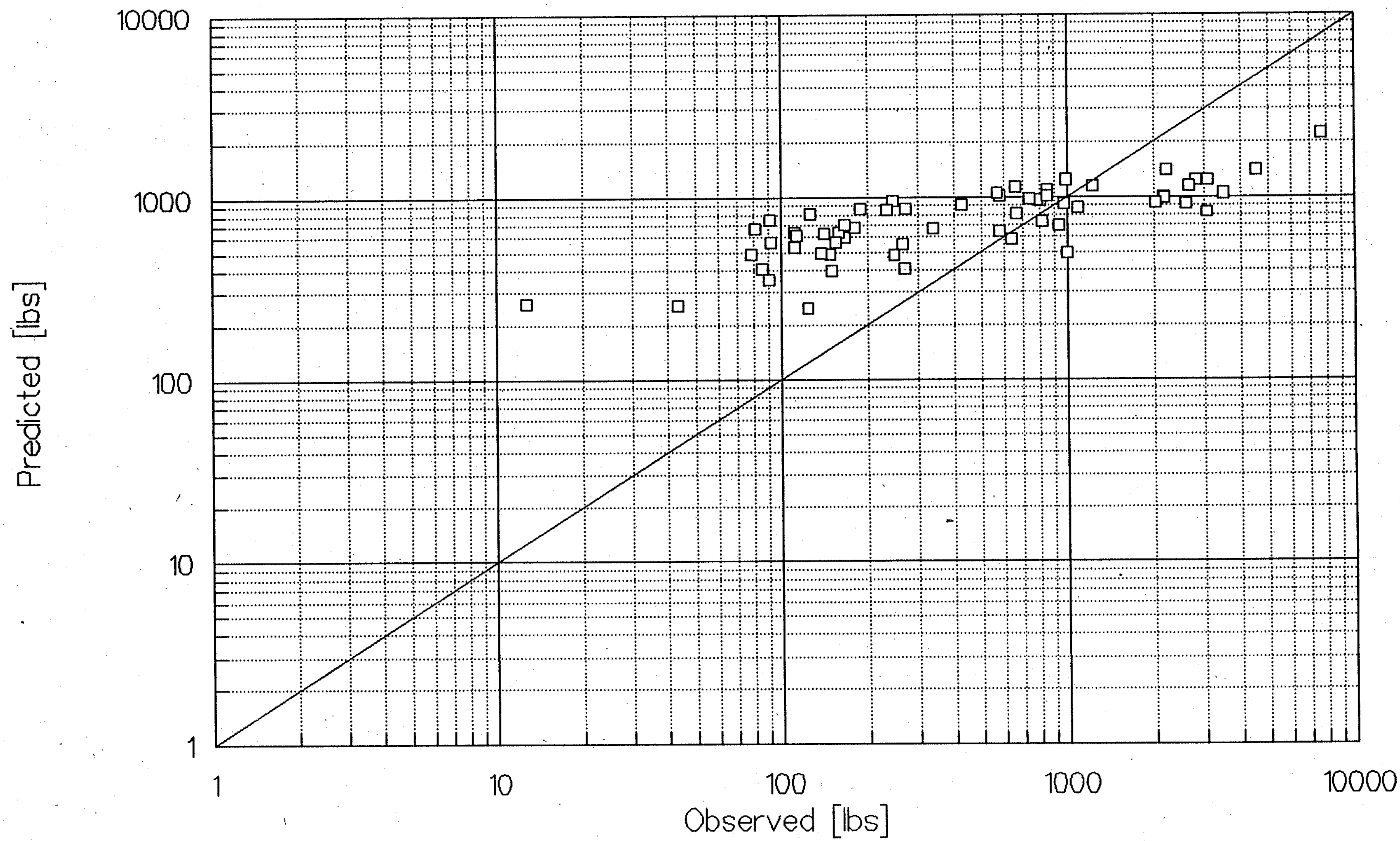
Wood Center
Total Runoff – Predicted vs Residuals
Total Runoff Residuals [in]
.50
.40
.30
.20
.10
.00
–.10
–.20
–.30
–.40
–.50
0
.5
1
1.5
2
2.5
3
Predicted Total Runoff [in]
filename: WCEN00.CAL


Wood Center
Total Runoff — Rain vs Residuals
.50
.40
.30
.20
.10
.00
−.10
−.20
−.30
−.40
−.50
Total Runoff Residuals [in]
0
.5
1
1.5
2
2.5
3
3.5
4
Rain (in)
filename: WCEN00.CAL

9	A	B	C	S	T	U	V	W	X	Y	Z	AA
10	filename:	WCENOO.CAL			SS	SS	Calc SS	Calc SS	SS Resid	SS Resid		
11					N.FILT.	N.FILT.	w/o Del	w/ Del	w/o Del	w/ Del		
12	CODE	DATE	RAIN		RESID.	RESID.						Outliers
13	. # .		(in)		(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]		
14												
15	53	3/15/80	.23		98	148	805	490	-657	-342		
16	54	4/ 3/80	.16		132	166	953	605	-787	-439		
17	55	4/ 4/80	.34		44	111	1028	638	-917	-527		
18	56	4/ 6/80	.08		210	90	682	353	-592	-263		
19	57	4/ 9/80	.29		38	81	997	672	-916	-591		
20	60	5/28/80	.76		532	3070	1315	1230	1755	1840		
21	61	6/ 1/80	.30		38	91	910	750	-819	-659		
22	62	6/ 2/80	.59		161	805	1019	942	-214	-137		
23	63	6/ 5/80	1.11		270	2801	1326	1240	1475	1561		
24	64	6/ 6/80	.66		438	2589	998	923	1591	1666		
25	65	6/ 7/80	1.04		348	3502	1121	1046	2381	2456		
26	66	6/19/80	.20		158	180	903	685	-723	-505		
27	67	7/ 5/80	.70		438	2160	1068	999	1092	1161		
28	68	7/ 9/80	.72		206	849	1165	1089	-316	-240		
29	69	7/15/80	.13		188	111	761	534	-650	-423		
30	70	7/16/80	.06		141	13	524	264	-511	-251		
31	71	7/26/80	1.59		64	988	1353	1244	-365	-256		
32	72	8/ 2/80	.18		244	266	743	546	-477	-280		
33	73	8/ 2/80	.17		72	92	695	565	-603	-473		
34	74	8/ 4/80	3.24		246	7636	2364	2210	5272	5426		*
35	75	8/ 7/80	1.44		180	2216	1480	1384	736	832		
36	76	8/ 7/80	.48		58	248	690	485	-442	-237		
37	78	8/16/80	.34		45	113	769	617	-656	-504		
38	80	4/ 8/81	1.08		280	2642	1346	1142	1296	1500		
39	81	4/13/81	1.42		342	4524	1502	1404	3022	3120		*
40	82	4/22/81	.22		82	126	948	807	-822	-681		
41	83	5/23/81	.23		585	993	866	489	127	504		
42	84	5/29/81	.27		186	340	780	672	-440	-332		
43	85	6/ 8/81	.30		336	637	910	587	-273	50		
44	86	6/13/81	.59		56	272	934	865	-662	-593		
45	88	6/20/81	.16		390	269	736	405	-467	-136		
46	89	7/12/81	.44		290	935	958	699	-23	236		
47	90	7/17/81	.18		143	158	767	634	-609	-476		
48	91	7/20/81	.05		442	124	469	248	-345	-124		
49	92	7/27/81	.39		57	166	973	708	-807	-542		
50	93	8/14/81	.65		49	245	1022	951	-777	-706		
51	94	8/15/81	.33		283	661	895	811	-234	-150		
52	95	8/26/81	.68		120	660	1216	1137	-556	-477		
53	96	8/29/81	.99		236	2175	1064	985	1111	1190		
54	97	8/31/81	1.04		61	582	1106	1018	-524	-436		
55	98	9/ 7/81	.63		44	234	964	855	-730	-621		
56	99	9/21/81	.46		53	188	985	862	-797	-674		
57	100	10/ 6/81	.69		204	1218	1222	1143	-4	75		
58	101	10/17/81	.44		116	425	988	910	-563	-485		
59	102	10/17/81	.61		136	785	1034	967	-249	-182		
60	103	4/ 2/82	.83		288	2030	1069	926	961	1104		
61	104	4/ 2/82	.09		132	86	600	401	-514	-315		
62	105	4/ 2/82	1.06		125	970	1044	922	-74	48		
63	106	4/ 3/82	.22		72	78	663	491	-585	-413		
64	107	4/16/82	.64		764	3051	896	823	2155	2228		
65	108	4/16/82	.12		160	150	575	395	-425	-245		
66	109	5/11/82	.38		516	850	1088	1003	-238	-153		
67	110	5/15/82	.17		524	581	783	652	-202	-71		
68	111	5/18/82	.05		256	43	487	255	-444	-212		
69	113	5/22/82	.96		137	733	1080	981	-347	-248		
70	114	5/26/82	.17		204	141	826	626	-685	-485		
71	115	5/27/82	.12		164	138	719	496	-581	-358		
72	116	5/29/82	.12		322	154	741	565	-587	-411		
73	117	6/15/82	.92		91	569	1205	1056	-636	-487		
74	118	6/20/82	.19		748	814	862	731	-48	83		
75	119	6/25/82	.68		244	1084	959	872	125	212		
76												
77												
78	Minimum :		.05		38	13	469	248	-917	-706		
79	Maximum :		3.24		764	7636	2364	2210	5272	5426		
80	Average :		.55		222.738	953	966	803	-13	150		
81	Std.Dev.:		.51		170.147	1330	291	333	1112	1088		
82	Count :		61		61	61	61	61	61	61		
83	COV :		.94		.76	1.40	.30	.41				
84	Sum :		33.38		13587	58156	58951	49005	-795	9151		
85	Sum-outliers:					45996	55085	45391	-9089	605		

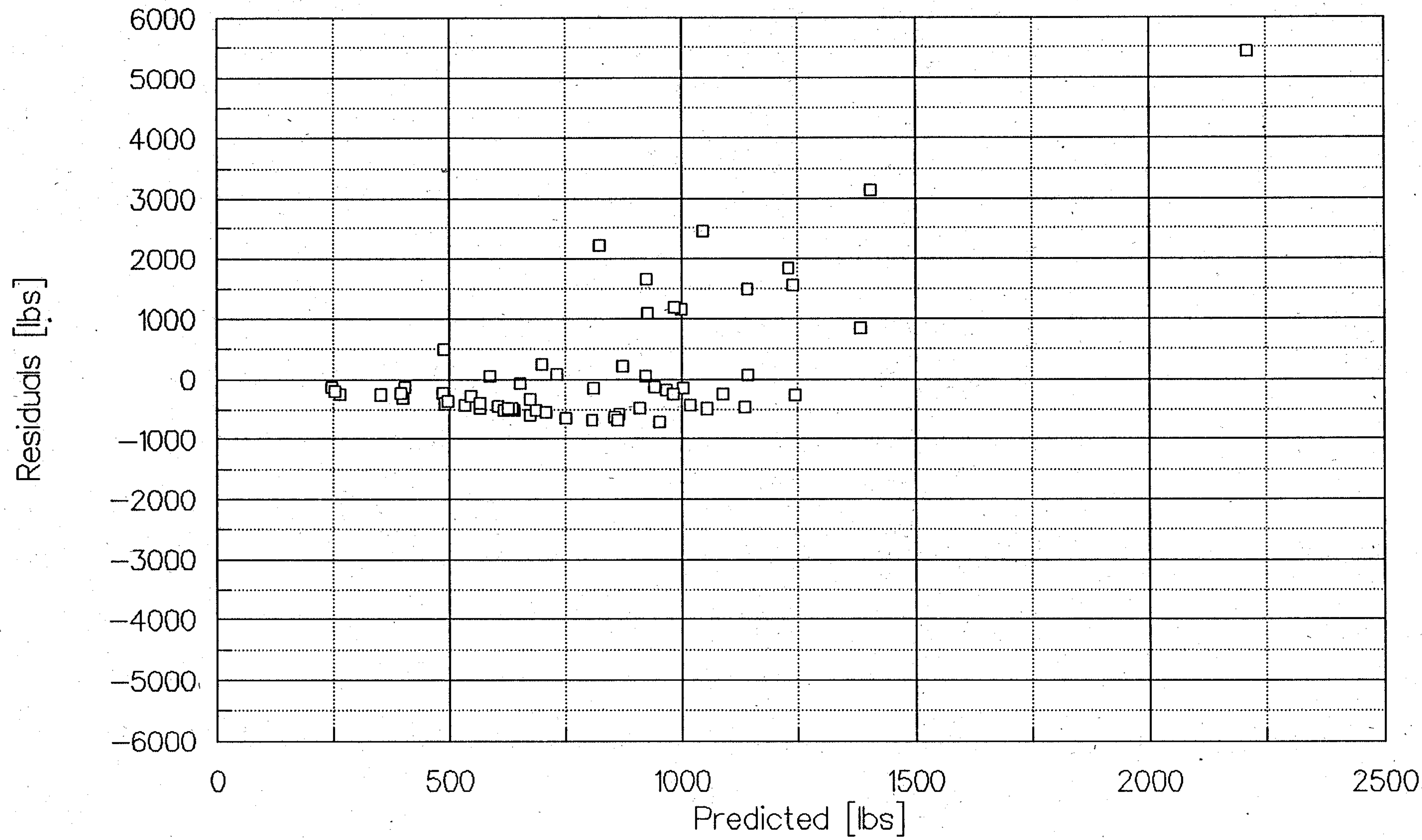
Wood Center
Suspended Solids: Observed vs Predicted

w/ Delivery at Outfall



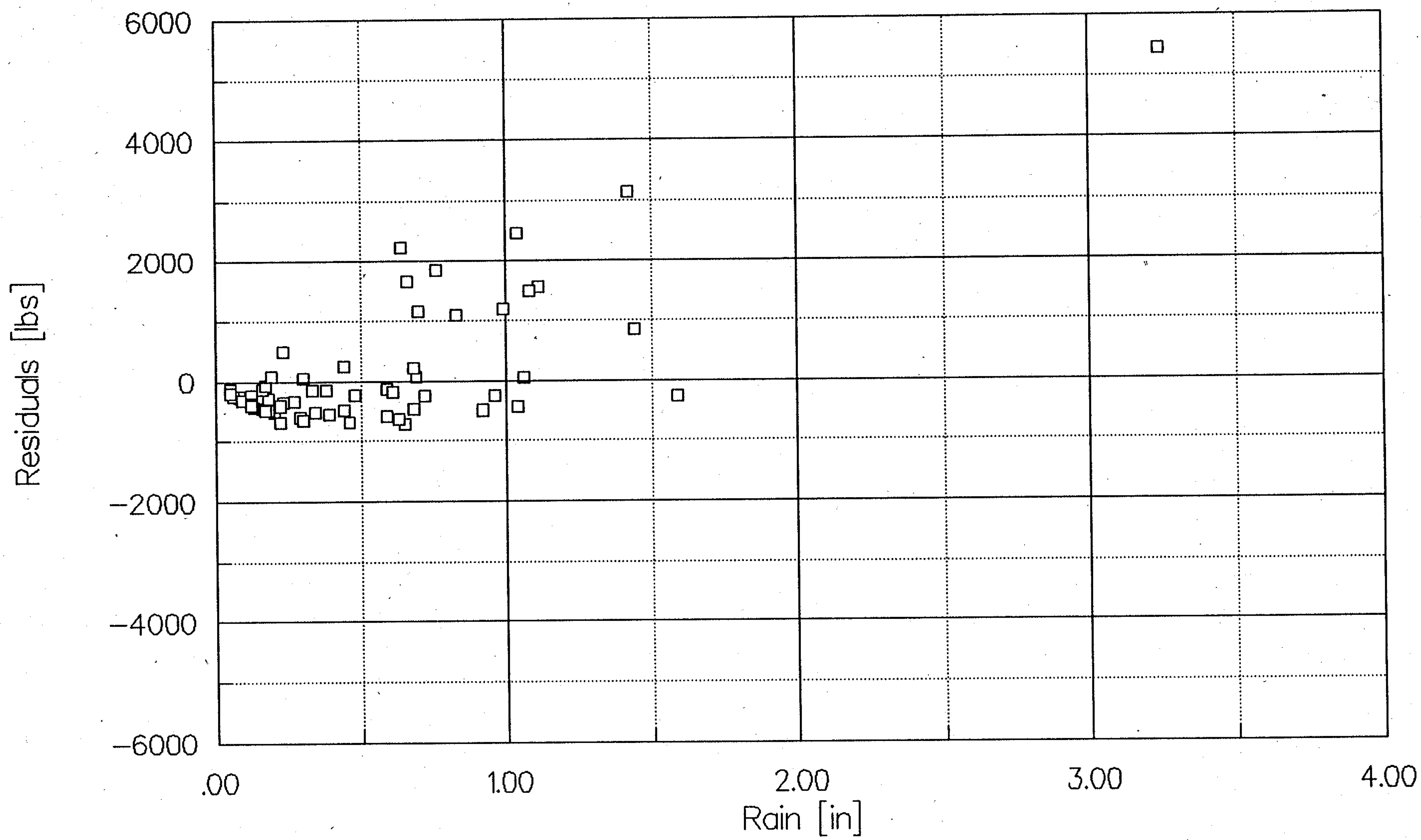
filename: WCEN00.CAL

Wood Center
Suspended Solids: Predicted vs Residuals
w/ Delivery at Outfall



filename: WCEN00.CAL
Residuals = Observed−Predicted

Wood Center
Suspended Solids: Rain vs Residuals
w/ Delivery at Outfall



filename: WCEN00.CAL
Residuals = Observed−Predicted

B8

Hastings 1990 Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: HAST103.DAT

Hastings 1990	Observed	Predicted	Residuals
Runoff [in]			
Average	0.31	0.22	0.09
Std Dev	0.29	0.12	–
COV	0.92	0.52	–
Sum	4.06	2.91	1.14
Count	13		
Runoff - outliers [in]			
Average	0.21	0.20	0.01
Std Dev	0.12	0.11	–
COV	0.56	0.52	–
Sum	2.32	2.24	0.08
Count	11		
Rv			
Average	0.44	0.34	0.10
Std Dev	0.25	0.04	–
COV	0.56	0.11	–
SS w/Delivery [lbs]			
Average	222	88	135
Std Dev	367	48	–
COV	1.65	0.55	–
Sum	2889	1138	1751
Count	13		
SS w/Delivery - outliers [lbs]			
Average	68	78	-10
Std Dev	62	43	–
COV	0.92	0.55	–
Sum	743	858	-115
Count	11		

filename: DATASUM.WK1

JGV/RTB

Hastings with 1990 Data and MMILW6.RSV,MILW11.PSC,DELIV2.PRR

file:HAST103.CAL w/MILW11.PSC

Area [acres]: 32.40

Area Factor(ACF): 117612

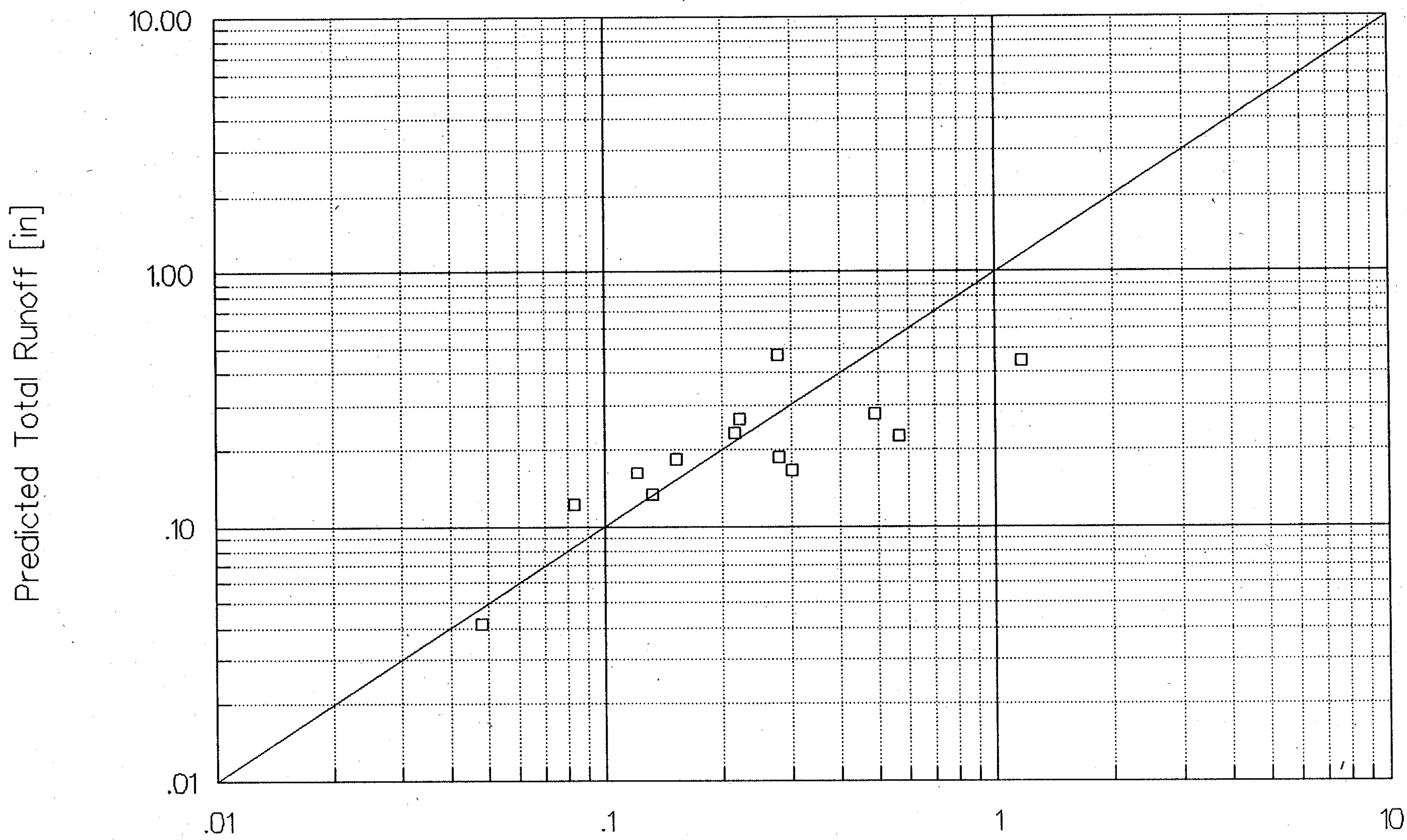
Solids Conversion Factor (SCF): 7.34

[1kg/10^6mg*2.204lbs/kg*1liter/0.264gal*1gal/0.1337ft^3*1ft/12in*area(acres)*43560ft^2/acre] = .2266*area

Perfect Fit Line	
	.01
	10.00

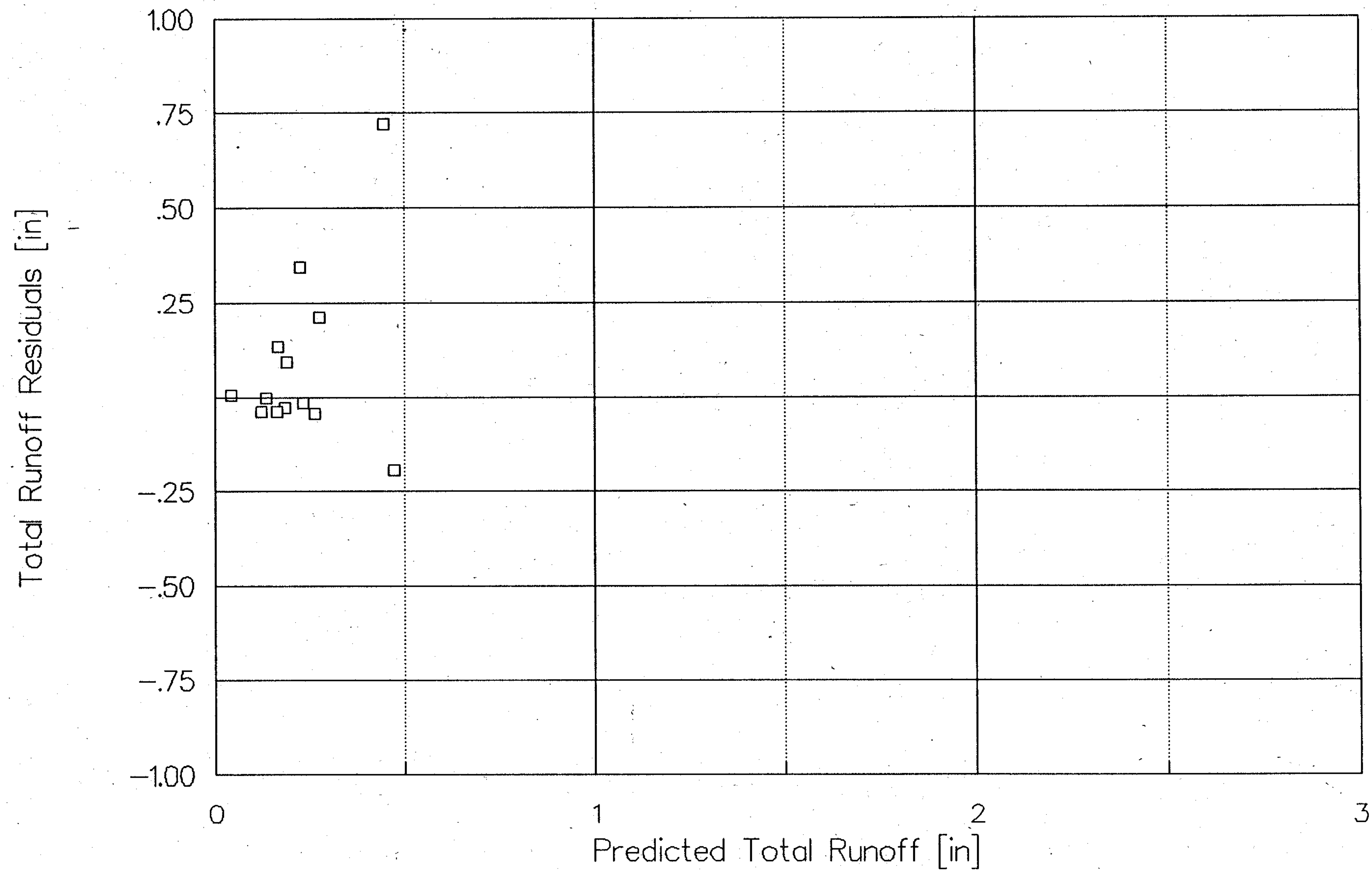
file:HAST103.CAL w/MILW11.PSC													
A	B	C	D	E	F	G	H	I	J	L	M	N	O
			Obs Ttl	OBS TOTAL	SLAMM TOTAL	SLAMM TOTAL	RESID TOTAL	RESID TOTAL	RESID/ OBS TTL	OBS TOTAL	SLAMM TOTAL	RESID TOTAL	RESID/ OBS TTL
CODE	DATE	RAIN	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RV	RV	RV	RV
. # .		(in)	(in)	(cu ft)	[in]	(cu ft)	[in]	(cu ft)	[ ]	(in/in)	(in/in)	(in/in)	[ ]
1	3/11/90	.65	.57	66679	.22	26412	.34	40267	.60	.87	.35	.52	.60
2	4/20/90	.75	.22	26049	.26	31058	-.04	-5009	-.19	.30	.35	-.05	-.19
3	5/ 4/90	1.24	.28	32663	.47	55484	-.19	-22821	-.70	.22	.38	-.16	-.70
4	5/ 9/90	.78	.49	57571	.28	32482	.21	25089	.44	.63	.36	.27	.43
5	5/16/90	.43	.13	15571	.13	15727		-156	-.01	.31	.31		-.01
6	5/19/90	.67	.21	25249	.23	27329	-.02	-2080	-.08	.32	.35	-.03	-.09
6.5	6/ 2/90	.18	.05	5642	.04	4868	.01	774	.14	.27	.23	.04	.14
7	6/13/90	1.18	1.17	137382	.45	52399	.72	84983	.62	.99	.38	.61	.62
8	6/16/90	.55	.15	17988	.18	21594	-.03	-3606	-.20	.28	.34	-.06	-.22
9	6/19/90	.40	.08	9774	.12	14362	-.04	-4588	-.47	.21	.31	-.10	-.49
10	6/22/90	.50	.12	14267	.16	19070	-.04	-4803	-.34	.24	.33	-.09	-.36
11	6/22/90	.51	.30	35412	.17	19566	.13	15846	.45	.59	.33	.26	.44
13	6/29/90	.56	.28	32829	.19	22112	.09	10717	.33	.50	.34	.16	.32
Minimum :		.18	.05	5642	.04	4868	-.19	-22821	-.70	.21	.23	-.16	-.70
Maximum :		1.24	1.17	137382	.47	55484	.72	84983	.62	.99	.38	.61	.62
Average :		.65	.31	36698	.22	26343	.09	10355	.04	.44	.34	.10	.04
Std.Dev.:		.28	.29	33670	.12	13716	.22	26389	.41	.25	.04	.24	.41
Count :		13	13	13	13	13	13	13	13	13	13	13	13
COV :		.44	.92	.92	.52	.52				.56	.11		
Sum :		8.40	4.06	477076	2.91	342463	1.14	134613	.58	5.72	4.36	1.36	.48

Hastings
Total Runoff — Predicted v Observed



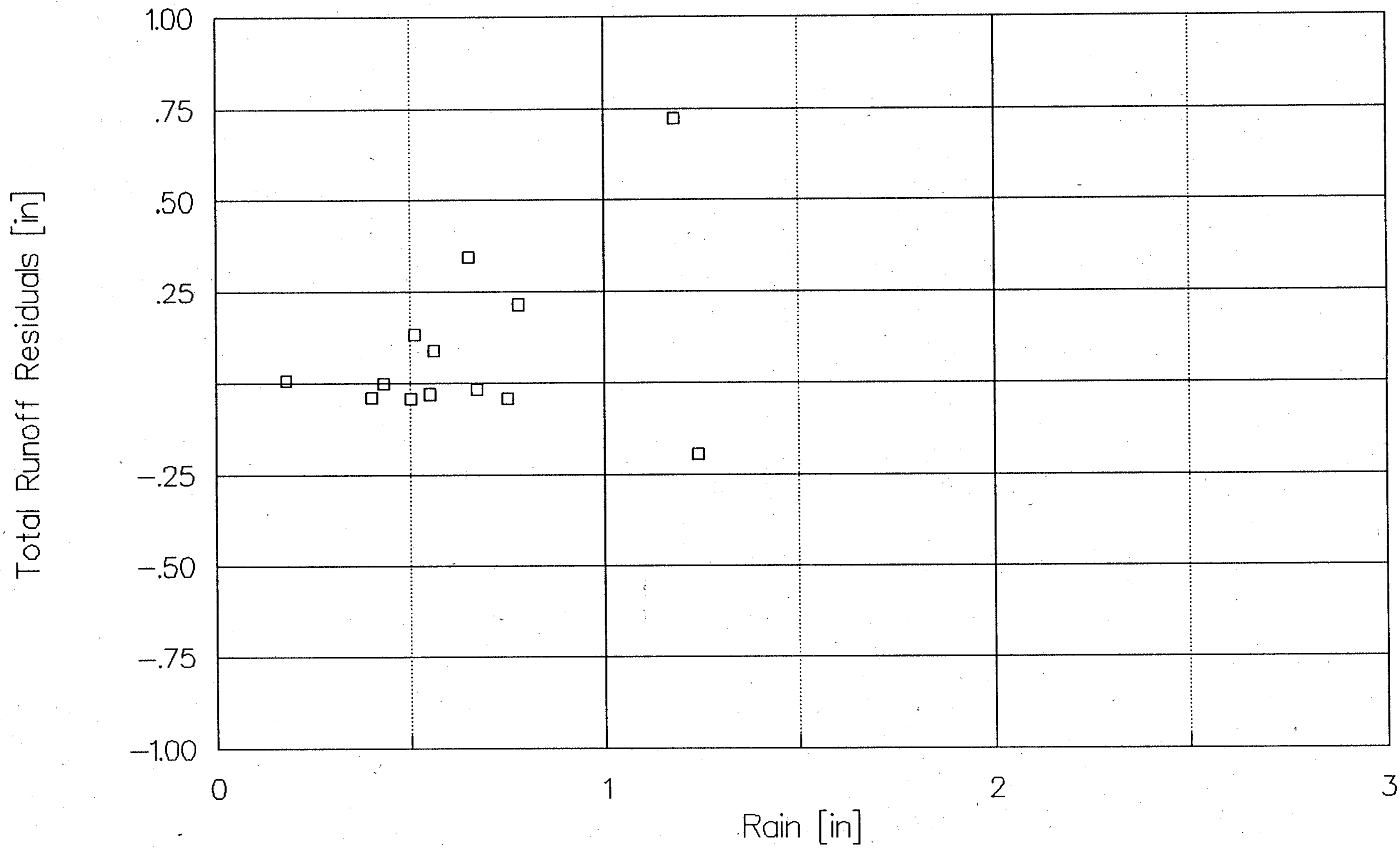
file:HAST103.CAL w/MILW11.PSC

Hastings
Total Runoff Residuals vs Predicted Runoff



file:HAST103.CAL w/MILW11.PSC

Hastings
Total Runoff: Rain vs Residuals



file:HAST103.CAL w/MILW11.PSC
Residuals = Observed − Predicted

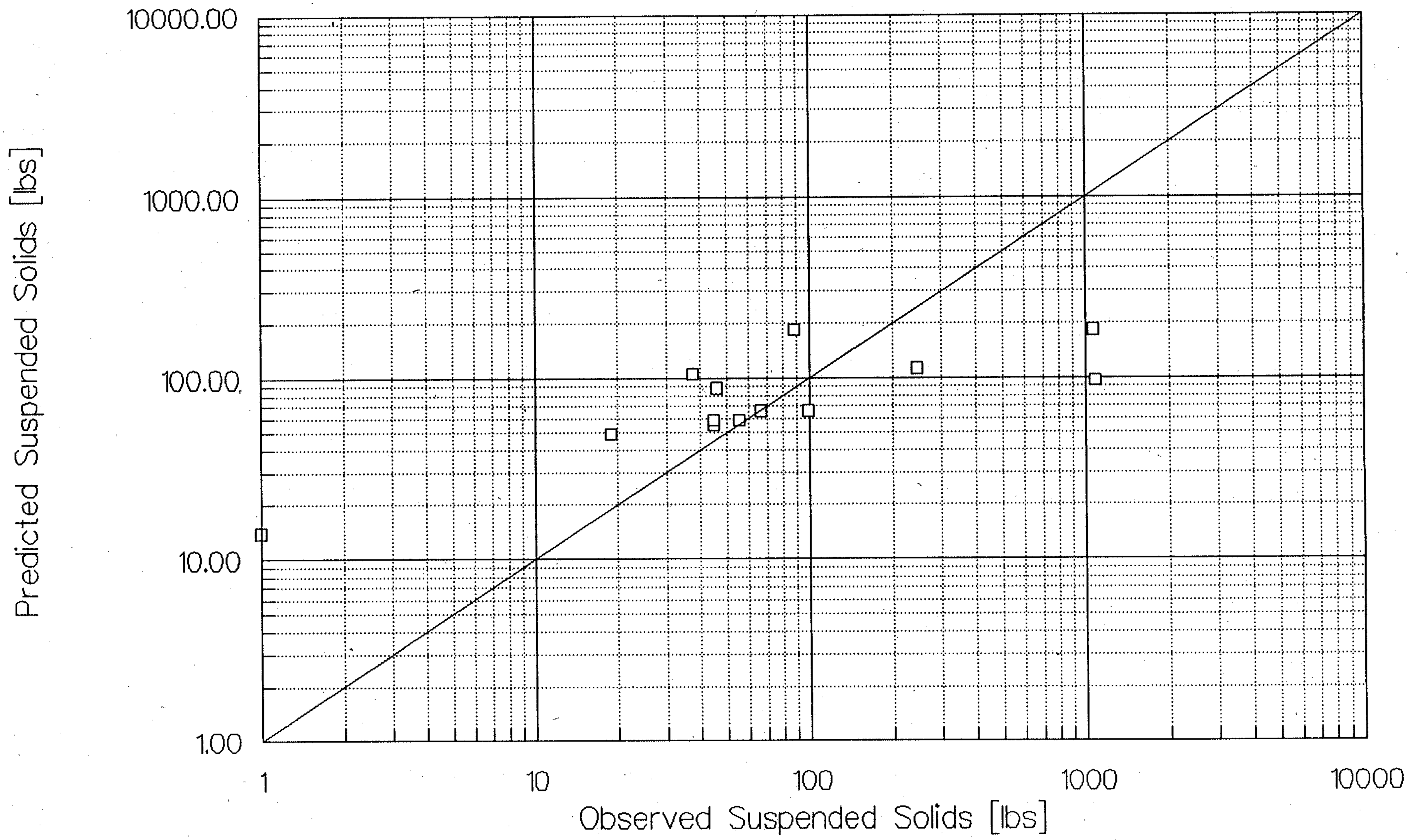
| A || B || C || P || Q || R || S || T || U || V || W ||X|| Y |

Hastings with 1990 Data a .10
file:HAST103.CAL w/MILW11 >>>>>>>
Area [acres]: 32.40
Area Factor(ACF): 117612
Solids Conversion Factor
[1kg/10^6mg*2.204lbs/kg

file:HAST103.CAL w/MILW11

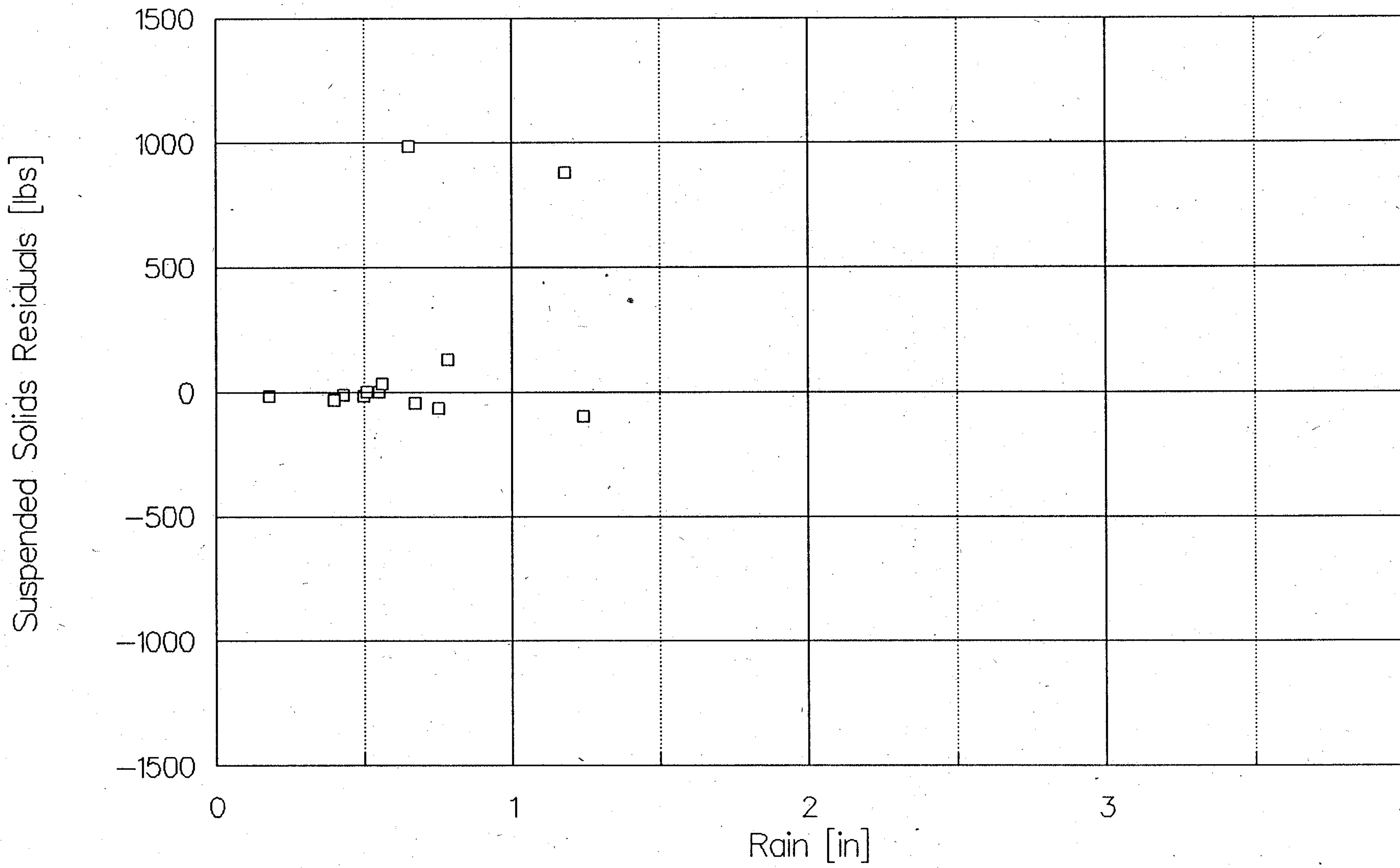
CODE . # .	DATE	RAIN (in)	SS N.FILT. RESID. (mg/l)	SS N.FILT. RESID. (lbs)	Calc SS w/o Del [lbs]	Calc SS w/ Del [lbs]	SS Resid w/o Del [lbs]	SS Resid w/ Del [lbs]	SS Resid w/ Del [ ]	Outliers
1	3/11/90	.65	260	1082	225	97	857	985	10.16	*
2	4/20/90	.75	23	37	235	105	-198	-68	-.64	
3	5/ 4/90	1.24	43	88	272	186	-184	-98	-.53	
4	5/ 9/90	.78	68	244	221	113	23	131	1.16	
5	5/16/90	.43	46	45	189	55	-144	-10	-.19	
6	5/19/90	.67	29	46	205	88	-159	-42	-.48	
6.5	6/ 2/90	.18	0	0	169	14	-169	-14	-1.00	
7	6/13/90	1.18	124	1063	282	183	781	880	4.81	*
8	6/16/90	.55	59	66	206	66	-140	0	.004	
9	6/19/90	.40	31	19	183	49	-164	-30	-.61	
10	6/22/90	.50	50	45	183	58	-138	-13	-.23	
11	6/22/90	.51	25	55	171	58	-116	-3	-.05	
13	6/29/90	.56	48	98	179	66	-81	32	.49	
Minimum :		.18	0	0	169	14	-198	-98		
Maximum :		1.24	260	1082	282	186	857	985		
Average :		.65	62	222	209	88	13	135		
Std.Dev.:		.28	64	367	35	48	348	345		
Count :		13	13	13	13	13	13	13		
COV :		.44	1.03	1.65	.17	.55				
Sum :		8.40	806	2889	2720	1138	169	1751		
Less Outliers ==>				743		858		-115		

Hastings
Suspended Solids — Predicted v Observed
w/ Delivery at Outfall



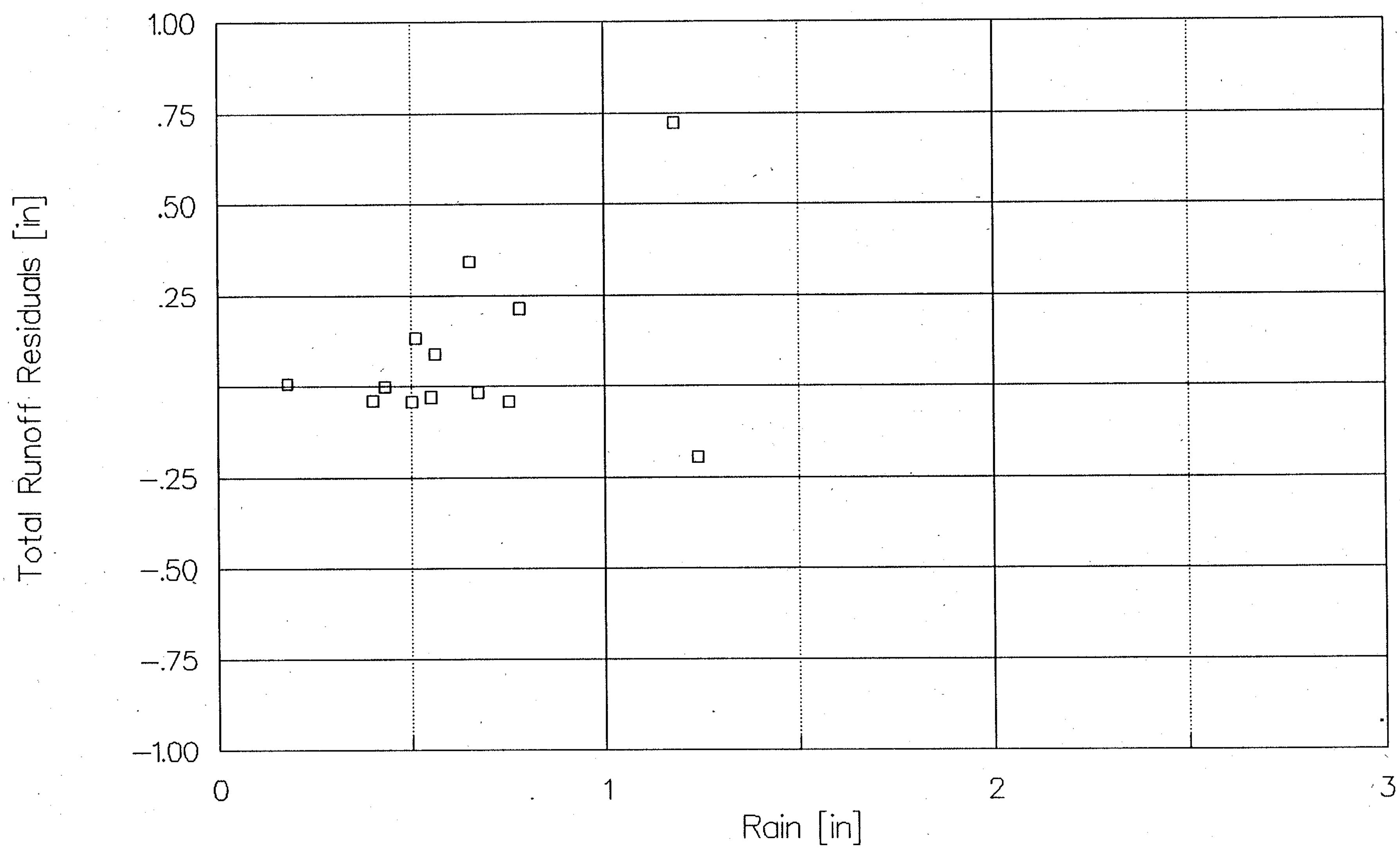
file:HAST103.CAL w/MILW11.PSC

Hastings
Suspended Solids: Residuals vs Rain
w/ Delivery at Outfall



file:HAST103.CAL w/MILW11.PSC

Hastings
Total Runoff: Rain vs Residuals



file:HAST103.CAL w/MILW11.PSC
Residuals = Observed - Predicted

B9

Wood Center 1990 Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: WCEN103.DAT

Wood Center - 1990	Observed	Predicted	Residuals
Runoff [in]			
Average	0.37	0.47	-0.10
Std Dev	0.23	0.32	–
COV	0.62	0.68	–
Sum	7.02	8.91	-1.89
Count	19		
Runoff – outliers [in]			
Average	0.39	0.49	-0.09
Std Dev	0.24	0.34	–
COV	0.61	0.69	–
Sum	5.89	7.32	-1.42
Count	15		
Rv			
Average	0.54	0.66	-0.12
Std Dev	0.07	0.06	–
COV	0.13	0.09	–
SS w/Delivery [lbs]			
Average	852	1038	-186
Std Dev	948	256	–
COV	1.11	0.25	–
Sum	13626	16066	-2980
Count	16		
SS w/Delivery – outliers [lbs]			
Average	1078	1025	53
Std Dev	996	207	–
COV	0.92	0.20	–
Sum	12936	12303	633
Count	12		

filename: DATASUM.WK1

JGV / RTB

| A || B || C || D || E || F || G || H || I || J || K || L || M || N || O |

Wood Center Analysis with 1990 Data — Perfect .01 .0%

filename: WCEN103.CAL — Fit Line 10.00 400.0%

A = 44.06 Acres Area convers factor(ACF): 159938

11/29/91 Area [acres]: 44.06

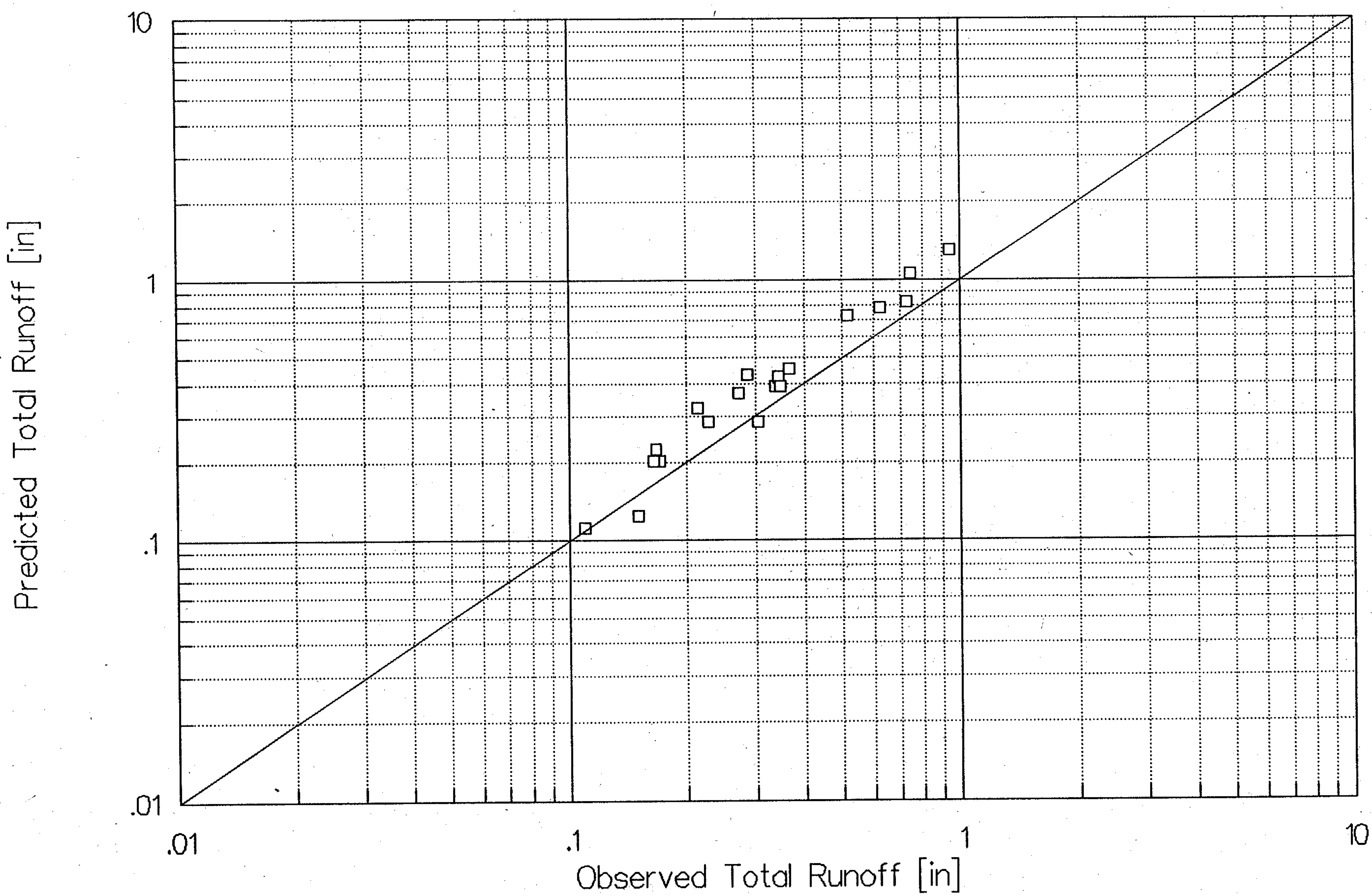
Solids Conversion Factor (SCF): 9.98

[1kg/10^6mg*2.204lbs/kg*1liter/0.264gal*1gal/0.1337ft^3*1ft/12in*area(acres)*43560ft^2/acre] = .2266*area

filename: WCEN103.CAL

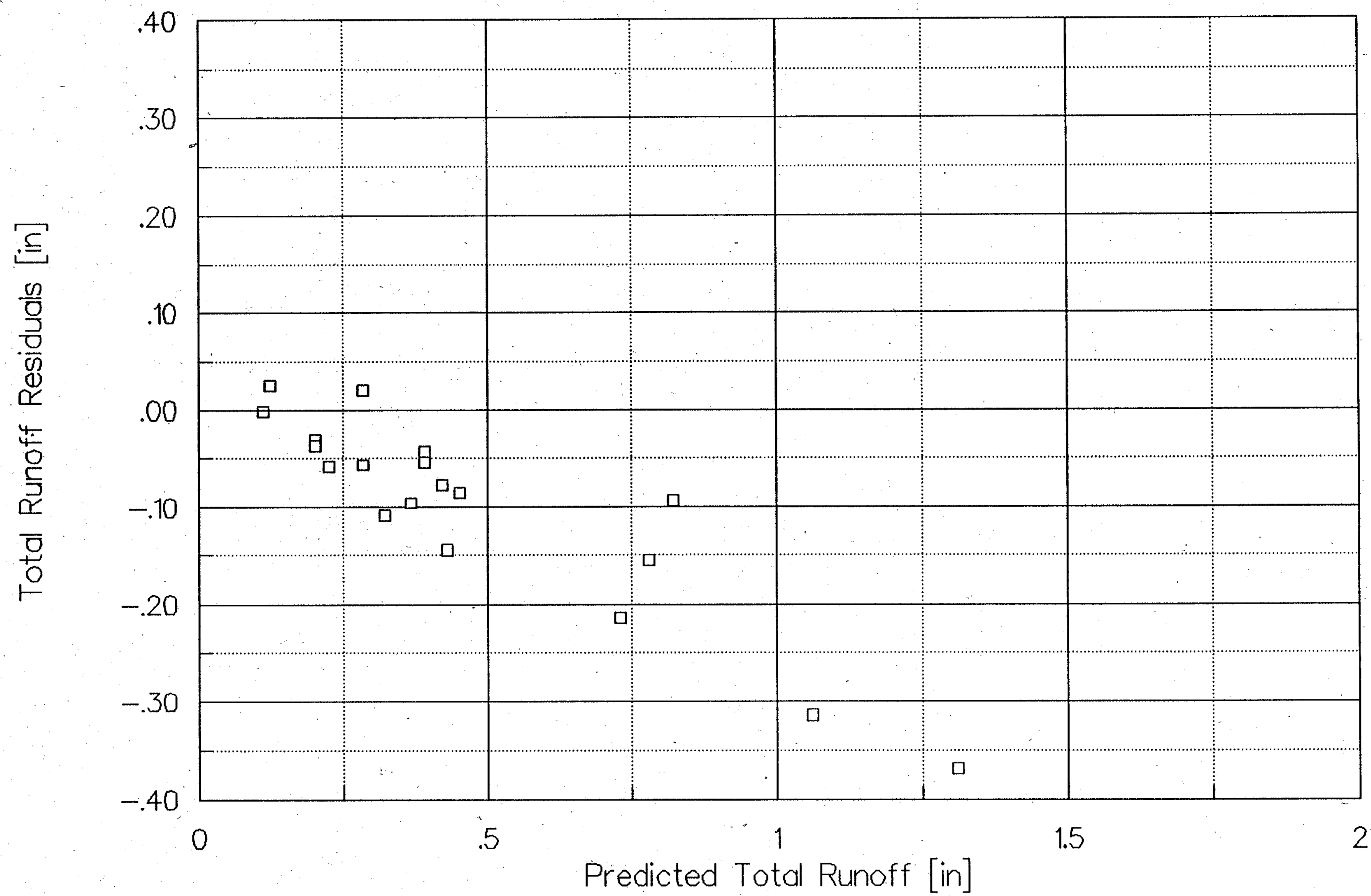
CODE . # .	DATE	RAIN (in)	Obs Ttl RUNOFF (in)	OBS TOTAL RUNOFF (cu ft)	SLAMM TOTAL RUNOFF [in]	SLAMM TOTAL RUNOFF (cu ft)	RESID TOTAL RUNOFF [in]	RESID TOTAL RUNOFF (cu ft)	RESID/ OBS TTL RUNOFF (%)	OBS TOTAL RV (in/in)	SLAMM TOTAL RV (in/in)	RESID TOTAL RV (in/in)	RESID/ OBS TTL RV (%)
1001	1/ 3/90	.34	.17	27265	.20	32241	-.03	-4976	-18.3%	.50	.60	-.10	-19.7%
1002	1/23/90	.23	.15	23990	.12	19880	.03	4110	17.1%	.65	.54	.11	17.2%
1003	3/ 8/90	.56	.27	43467	.37	58843	-.10	-15376	-35.4%	.49	.66	-.17	-36.0%
1004	3/11/90	.45	.23	36384	.28	45488	-.06	-9104	-25.0%	.51	.64	-.13	-26.6%
1005	3/13/90	.59	.34	54049	.39	62647	-.05	-8598	-15.9%	.57	.67	-.10	-17.0%
1006	4/ 1/90	.64	.29	45654	.43	68697	-.14	-23043	-50.5%	.45	.68	-.23	-52.5%
1007	4/ 9/90	.50	.21	34162	.32	51444	-.11	-17282	-50.6%	.43	.65	-.22	-52.2%
1008	4/20/90	1.02	.51	82363	.73	116621	-.21	-34258	-41.6%	.50	.72	-.22	-42.6%
1009	5/ 4/90	1.42	.75	119490	1.06	169789	-.31	-50299	-42.1%	.53	.75	-.22	-42.6%
1010	5/ 9/90	1.08	.62	99868	.78	124559	-.15	-24691	-24.7%	.58	.73	-.15	-26.3%
1011	5/19/90	.63	.34	55090	.42	67478	-.08	-12388	-22.5%	.55	.68	-.13	-24.4%
1012.1	6/ 2/90	.34	.16	26367	.20	32241	-.04	-5874	-22.3%	.48	.60	-.12	-23.7%
1012.2	6/14/90	.37	.17	26701	.22	35959	-.06	-9258	-34.7%	.45	.61	-.16	-35.2%
1013	6/17/90	.59	.35	55811	.39	62647	-.04	-6836	-12.2%	.59	.67	-.08	-13.3%
1014	6/19/90	.67	.37	58593	.45	72381	-.09	-13788	-23.5%	.55	.68	-.13	-24.4%
1015	6/22/90	.21	.11	17484	.11	17840	.00	-356	-2.0%	.52	.54	-.02	-3.7%
1016	6/22/90	.45	.30	48689	.28	45488	.02	3201	6.6%	.68	.64	.04	5.4%
1017	6/28/90	1.71	.94	150501	1.31	209551	-.37	-59050	-39.2%	.55	.77	-.22	-39.9%
1018	6/28/90	1.13	.73	116296	.82	131266	-.09	-14970	-12.9%	.64	.73	-.09	-13.4%
Minimum :		.21	.11	17484	.11	17840	-.37	-59050		.43	.54	-.23	
Maximum :		1.71	.94	150501	1.31	209551	.03	4110		.68	.77	.11	
Average :		.68	.37	59064	.47	75003	-.10	-15939	-27.0%	.54	.66	-.12	
Std.Dev.:		.40	.23	36490	.32	50729	.10	16194		.07	.06	.09	
Count :		19	19	19	19	19	19	19		19	19	19	
COV :		.58	.62	.62	.68	.68				.13	.09		
Sum :		12.93	7.02	1122224	8.91	1425060	-1.89	-302836	-27.0%	10.21	12.56	-2.35	-23.0%

Wood Center – 1990 Data
Total Runoff – Predicted vs Observed



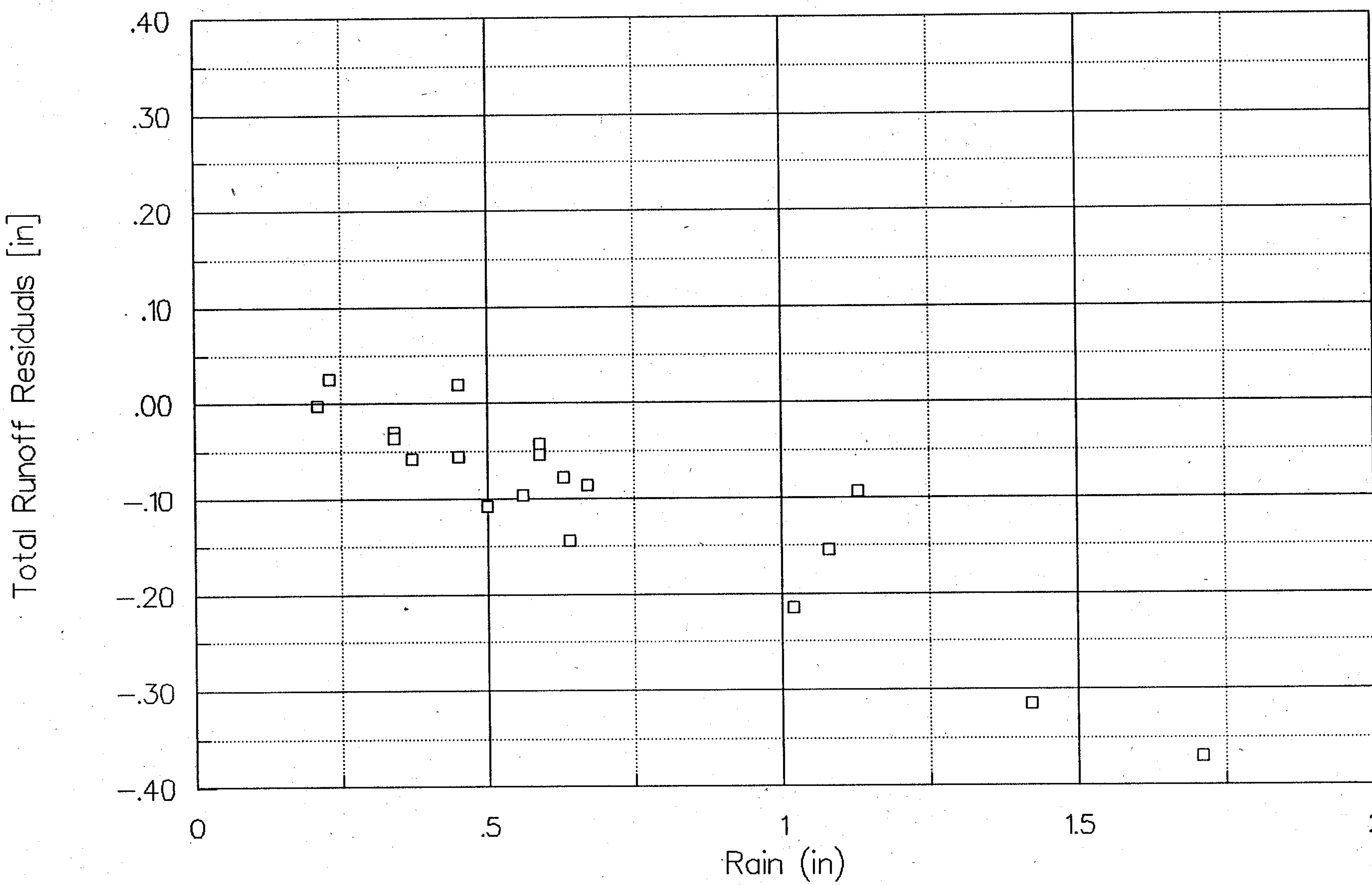
filename: WCEN103.CAL

Wood Center – 1990 Data
Predicted Total Runoff vs Residuals



filename: WCEN103.CAL

Wood Center – 1990 Data
Total Runoff – Rain vs Residuals

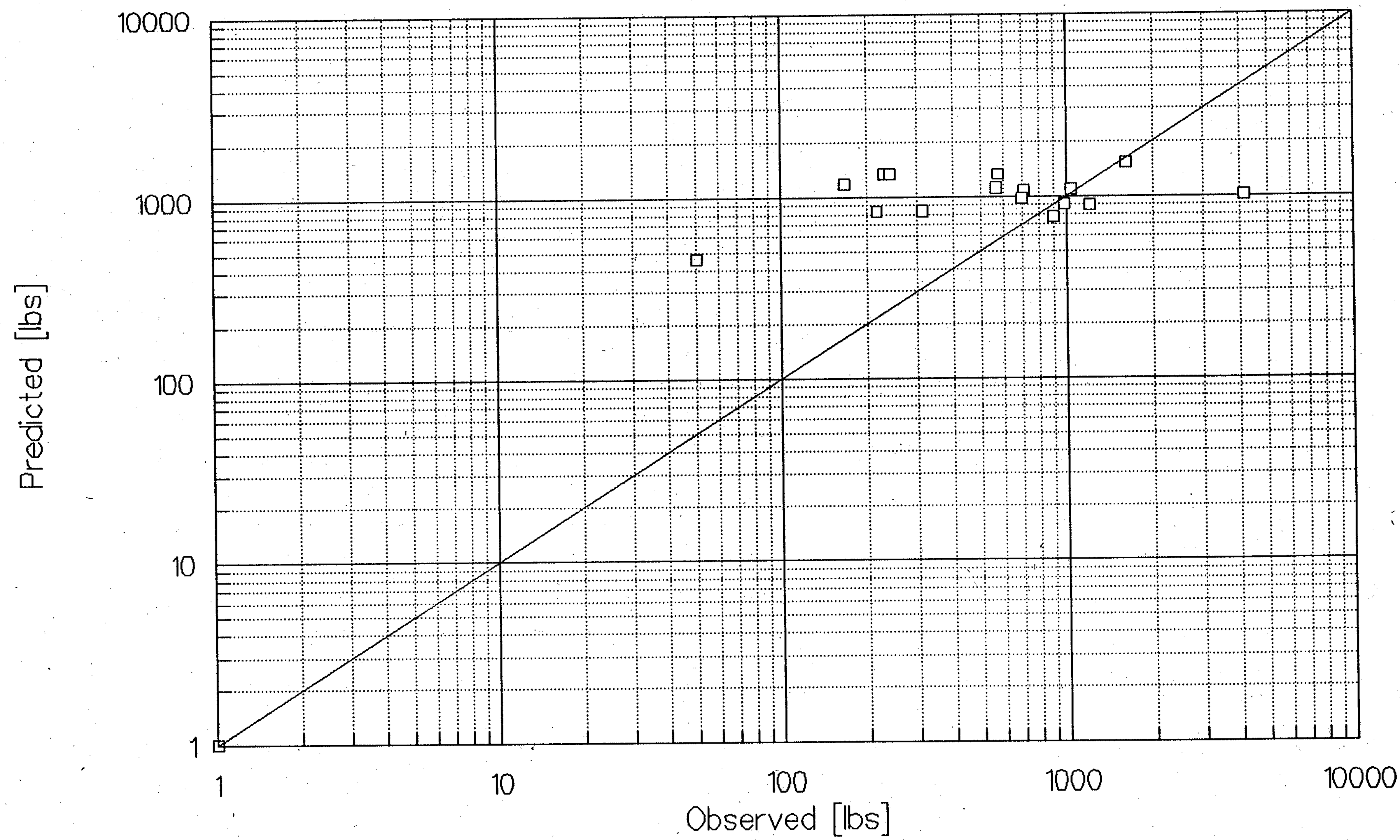


filename: WCEN103.CAL
Residuals = Predicted – Observed

	A	B	C	P	Q	R	S	T	U	V	W	X
1	Wood Center Analysis with			1								
2	filename: WCEN103.CAL			10000								
3	A = 44.06 Acres Area con											
4	11/29/91											
5	Solids Conversion Factor											
6	[1kg/10^6mg*2.204lbs/kg											
7												
8												
9												
10	filename: WCEN103.CAL				SS	SS	Calc SS	Calc SS	SS Resid	SS Resid	% Diff	Outliers
11					N.FILT.	N.FILT.	w/o Del	w/ Del	w/o Del	w/ Del		
12	CODE	DATE	RAIN		RESID.	RESID.						
13	. # .		(in)		(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]		
14												
15	1001	1/ 3/90	.34									
16	1002	1/23/90	.23									
17	1003	3/ 8/90	.56		208	564	1348	1106	-784	-542	-1.0	
18	1004	3/11/90	.45		312	709	1313	1067	-604	-358	-.5	
19	1005	3/13/90	.59		1230	4150	1326	1002	2824	3148	.8	
20	1006	4/ 1/90	.64		59	168	1531	1170	-1363	-1002	-6.0	*
21	1007	4/ 9/90	.50		108	230	1611	1335	-1381	-1105	-4.8	*
22	1008	4/20/90	1.02		47	242	1514	1338	-1272	-1096	-4.5	*
23	1009	5/ 4/90	1.42		77	574	1429	1317	-855	-743	-1.3	
24	1010	5/ 9/90	1.08		166	1035	1352	1087	-317	-52	-.1	
25	1011	5/19/90	.63		63	217	996	835	-779	-618	-2.9	
26	1012.1	6/ 2/90	.34		546	899	914	770	-15	129	.1	
27	1012.2	6/14/90	.37		188	313	1042	837	-729	-524	-1.7	
28	1013	6/17/90	.59		280	976	979	903	-3	73	.1	
29	1014	6/19/90	.67		190	695	1050	974	-355	-279	-.4	
30	1015	6/22/90	.21		46	50	682	460	-632	-410	-8.2	*
31	1016	6/22/90	.45									
32	1017	6/28/90	1.71		171	1607	1626	1520	-19	87	.1	
33	1018	6/28/90	1.13		165	1198	960	885	238	313	.3	
34												
35												
36	Minimum :		.21		46	50	682	460	-1381	-1105		
37	Maximum :		1.71		1230	4150	1626	1520	2824	3148		
38	Average :		.68		241	852	1230	1038	-378	-186		
39	Std.Dev.:		.40		283	948	276	256	955	961		
40	Count :		19		16	16	16	16	16	16		
41	COV :		.58		1.18	1.11	.22	.25				
42	Sum :		12.93		3856	13626	19673	16606	-6047	-2980		

Wood Center — 1990 Data
Suspended Solids: Observed vs Predicted

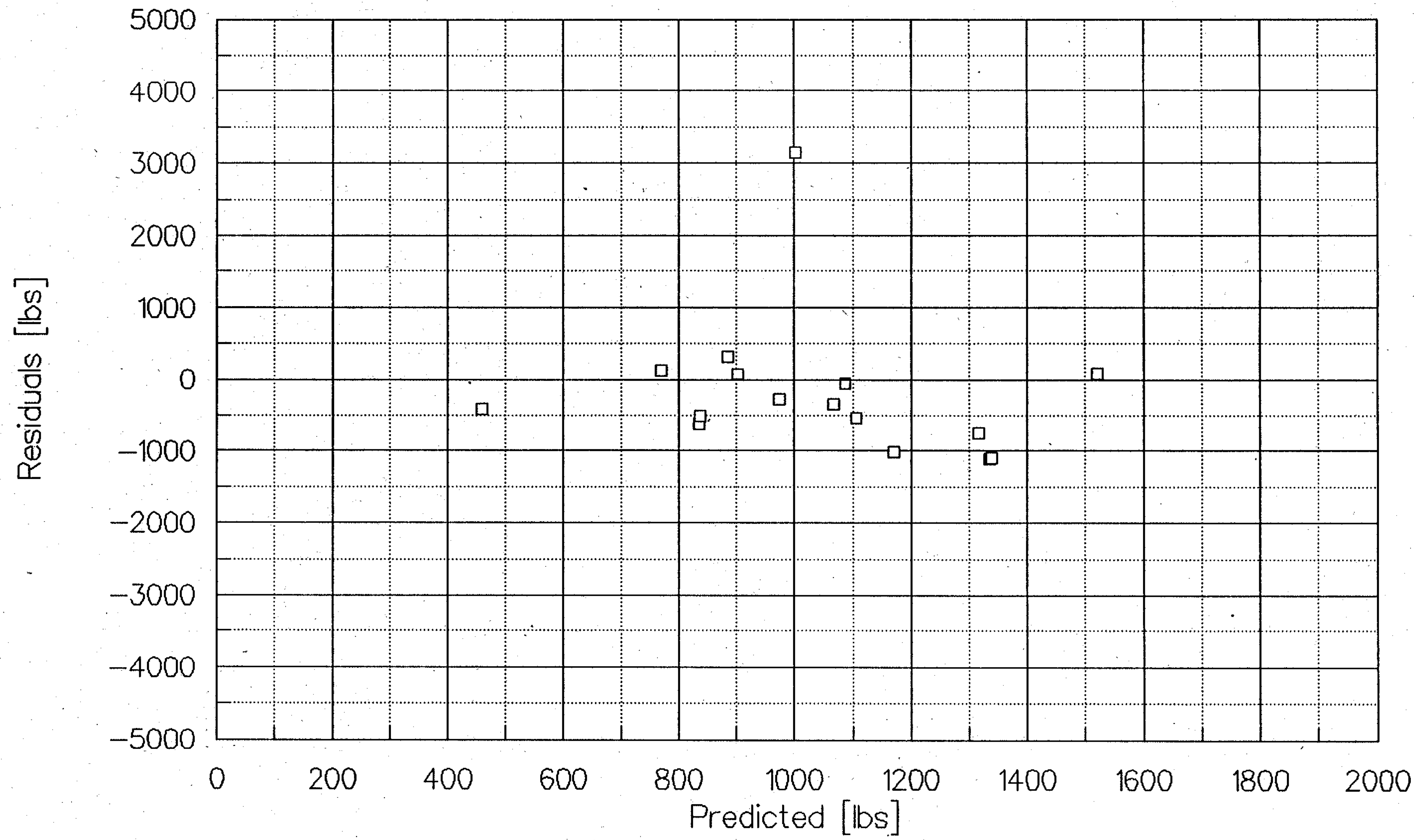
w/ Delivery at Outfall



filename: WCEN103.CAL

Wood Center — 1990 Data
Suspended Solids: Predicted vs Residuals

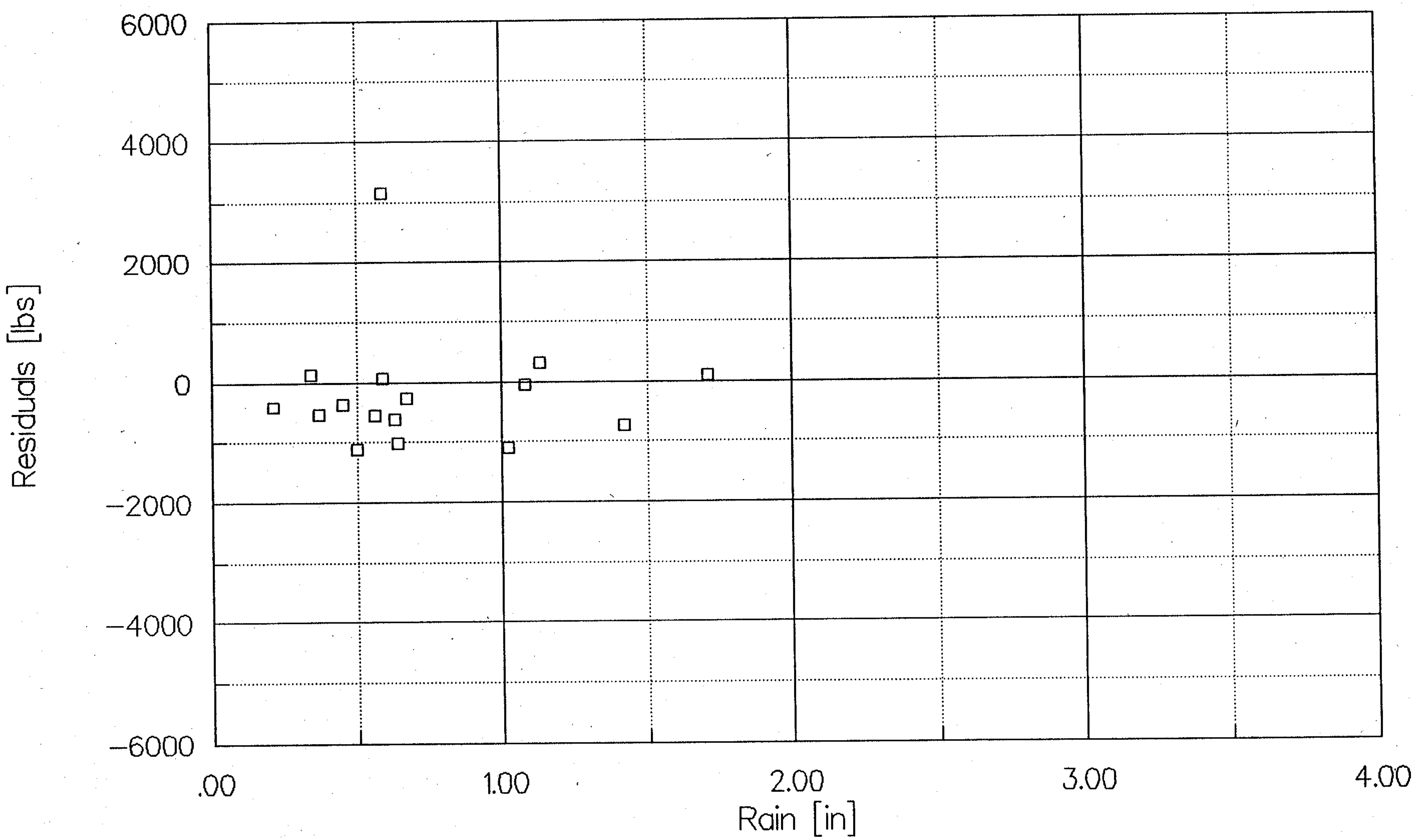
w/ Delivery at Outfall



filename: WCEN103.CAL
Residuals = Observed–Predicted

Wood Center — 1990 Data
Suspended Solids: Rain vs Residuals

w/ Delivery at Outfall



filename: WCEN103.CAL
Residuals = Observed–Predicted

B10

Monroe Street Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: MONROEØØ.DAT

Monroe St.	Observed	Predicted	Residuals
Runoff [in]			
Average	0.04	0.05	-0.01
Std Dev	0.04	0.05	—
COV	0.87	0.89	—
Sum	0.44	0.53	-0.09
Count	10		
Runoff - outliers [in]			
Average	0.04	0.04	-0.01
Std Dev	0.03	0.04	—
COV	0.90	0.86	—
Sum	0.33	0.38	-0.05
Count	9		
Rv			
Average	0.12	0.14	-0.02
Std Dev	0.04	0.03	—
COV	0.33	0.20	—
SS w/Delivery [lbs]			
Average	1018	1057	-39
Std Dev	1242	389	—
COV	1.22	0.37	—
Sum	8142	8452	-310
Count	8		
SS w/Delivery - outliers [lbs]			
Average	1126	1020	106
Std Dev	1292	403	—
COV	1.15	0.39	—
Sum	7882	7139	743
Count	7		

filename: DATASUM.WK1

JGV/RTB

| A || B || C || D || E || F || G || H || I || J ||K|| L || M || N || O |

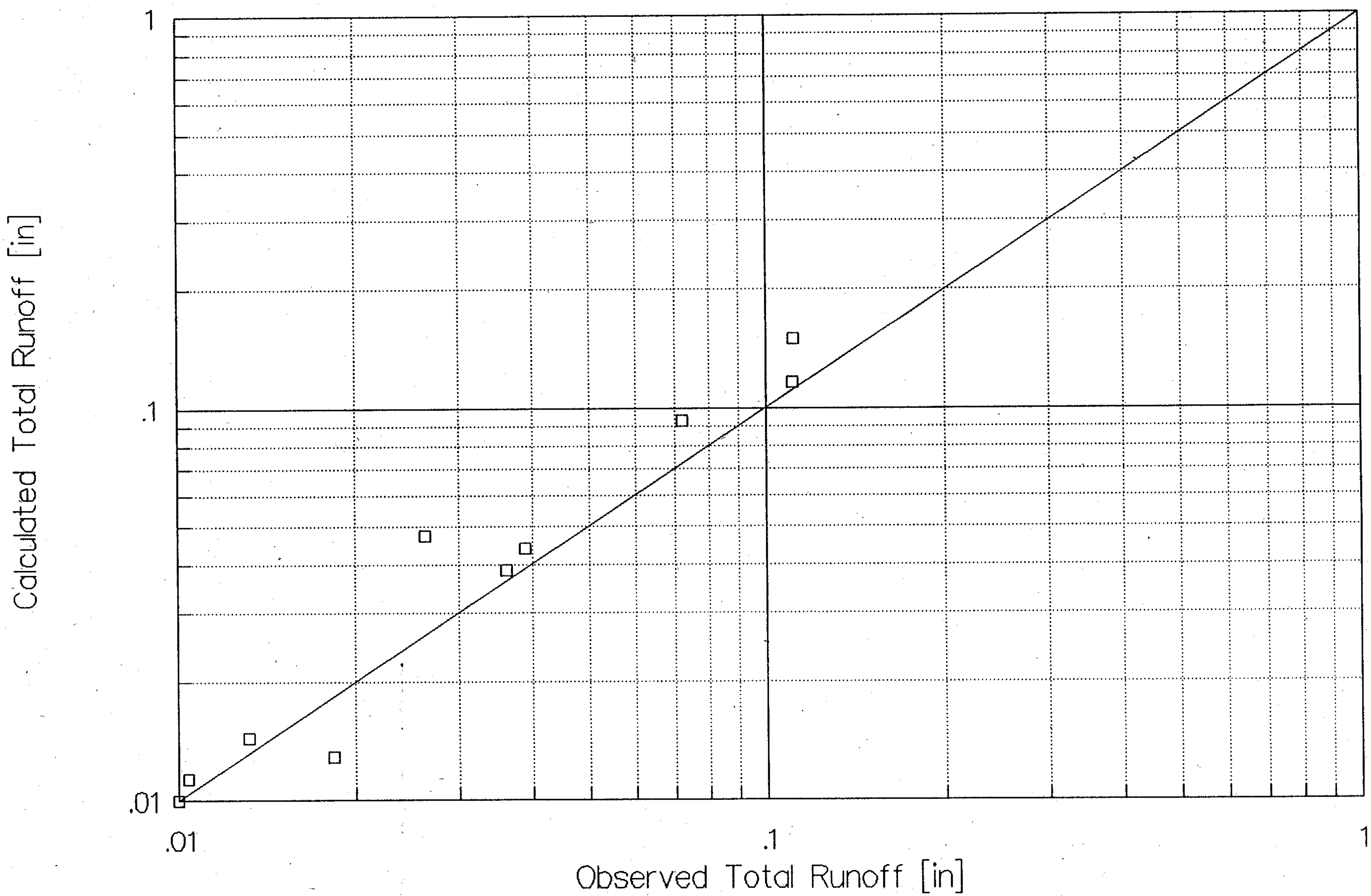
Monroe Street Data
MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR
Area(ac 244.95
Total Area Facto >>>>>
11/29/91
Solids Conv Factor(SCF 55.520

Obsrved Rv
Calc Rv
MILW Rv
Obsrved Data

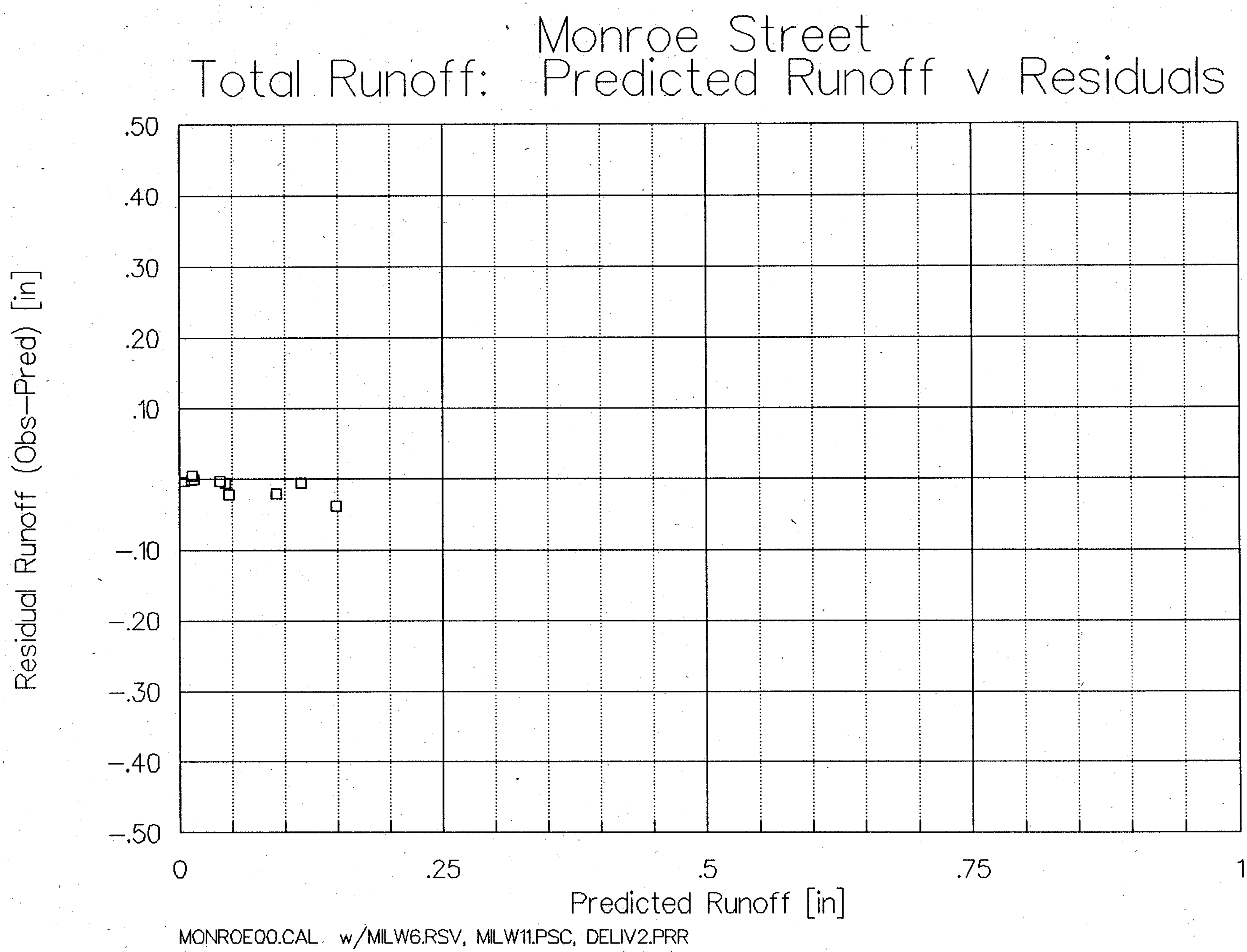
MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

CODE . # .	DATE	RAIN (in)	Obs Ttl RUNOFF (in)	Obs Ttl RUNOFF (cu ft)	Clc Ttl RUNOFF [in]	Clc Ttl RUNOFF (cu ft)	RESID TOTAL RUNOFF [in]	RESID TOTAL RUNOFF (cu ft)	RESID/ OBS TTL (%)	OBS TOTAL Rv (in/in)	CALC TOTAL Rv (in/in)	RESID TOTAL Rv (in/in)	RESID/ OBS TTL [frac]
1	910505	.84	.111	98857	.15	132743	-.04	-33886	-.34	.13	.18	-.05	-.36
3	910521	.06	.002	1448	.01	4702	.00	-3254	-2.25	.03	.09	-.06	-2.32
4	910525	.10	.010	9242	.01	10146	.00	-904	-.10	.10	.11	-.01	-.06
5	910530	.12	.013	11699	.01	12878	.00	-1179	-.10	.11	.12	-.01	-.09
6	910530	.11	.018	16317	.01	11497	.01	4820	.30	.17	.12	.05	.28
7	910610	.30	.039	34633	.04	39007	.00	-4374	-.13	.13	.15	-.02	-.16
8	910612	.55	.072	64144	.09	82267	-.02	-18123	-.28	.13	.17	-.04	-.30
9	910613	.32	.026	23412	.05	42223	-.02	-18811	-.80	.08	.15	-.07	-.82
10	910701	.27	.036	32234	.04	34328	.00	-2094	-.06	.13	.14	-.01	-.04
11	910707	.67	.111	98512	.12	103312	-.01	-4800	-.05	.17	.17	-.005	-.03
Maximum :		.84	.11	98857	.15	132743	.01	4820	.30	.17	.18	.05	.28
Minimum :		.06		1448	.01	4702	-.04	-33886	-2.25	.03	.09	-.07	-2.32
Average :		.33	.04	39050	.05	47310	-.01	-8261	-.38	.12	.14	-.02	-.39
Count :		10	10	10	10	10	10	10	10	10	10	10	10
Std.Dev.:		.25	.04	34088	.05	41935	.01	11094	.68	.04	.03	.03	.70
Sum :		3.34	.439	390498	.53	473103	-.09	-82605	-3.82	1.18	1.40	-.22	
COV :		.76	.87	.87	.89	.89				.33	.20		
Outlier Adj:													

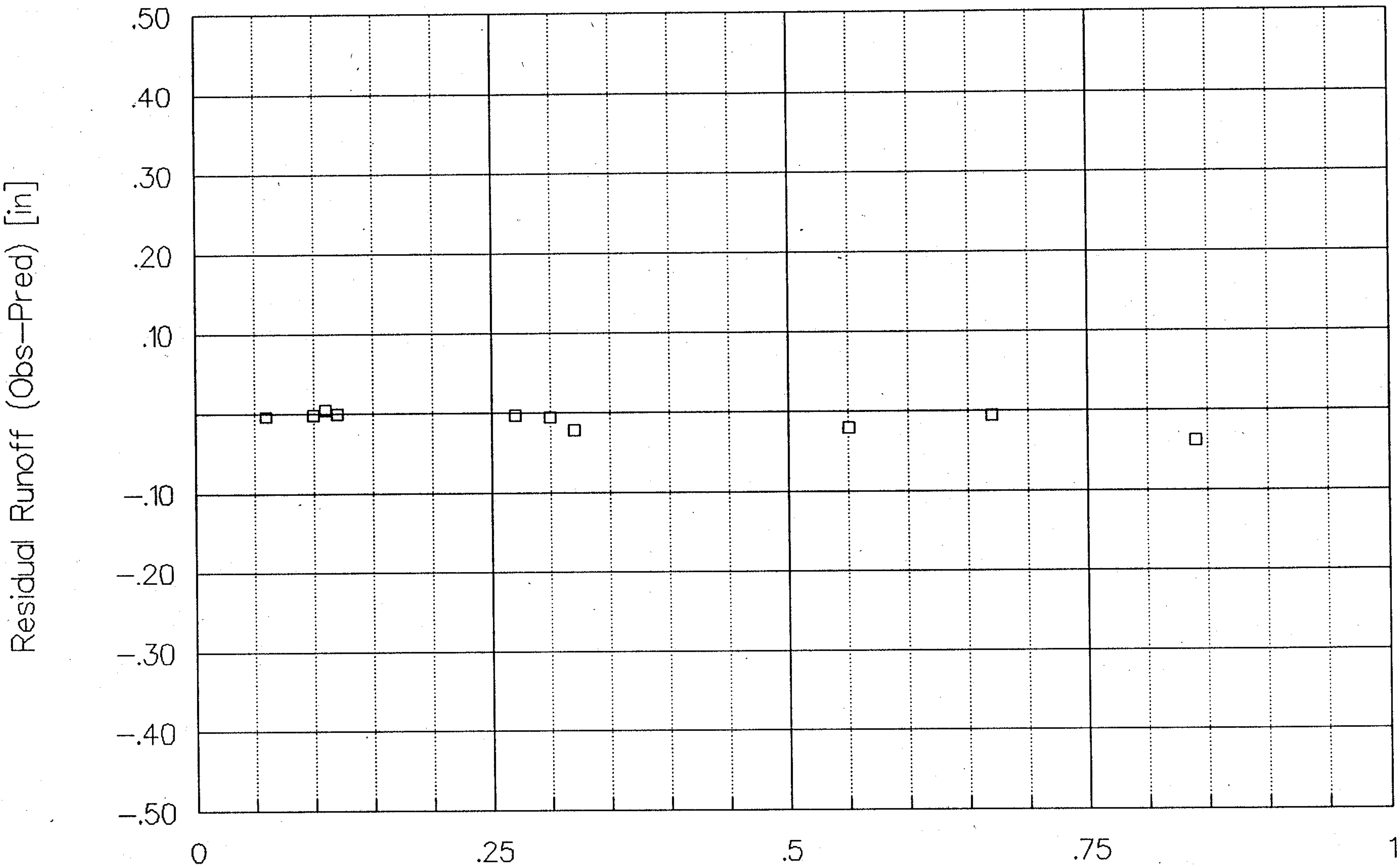
Monroe Street
Observed v Calc Total Runoff



MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR


Monroe Street
Total Runoff: Predicted Runoff v Residuals
.50
.40
.30
.20
.10
-.10
-.20
-.30
-.40
-.50
Residual Runoff (Obs-Pred) [in]
0
.25
.5
.75
1
Predicted Runoff [in]
MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

Monroe Street
Total Runoff: Rain v Residual Runoff



MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

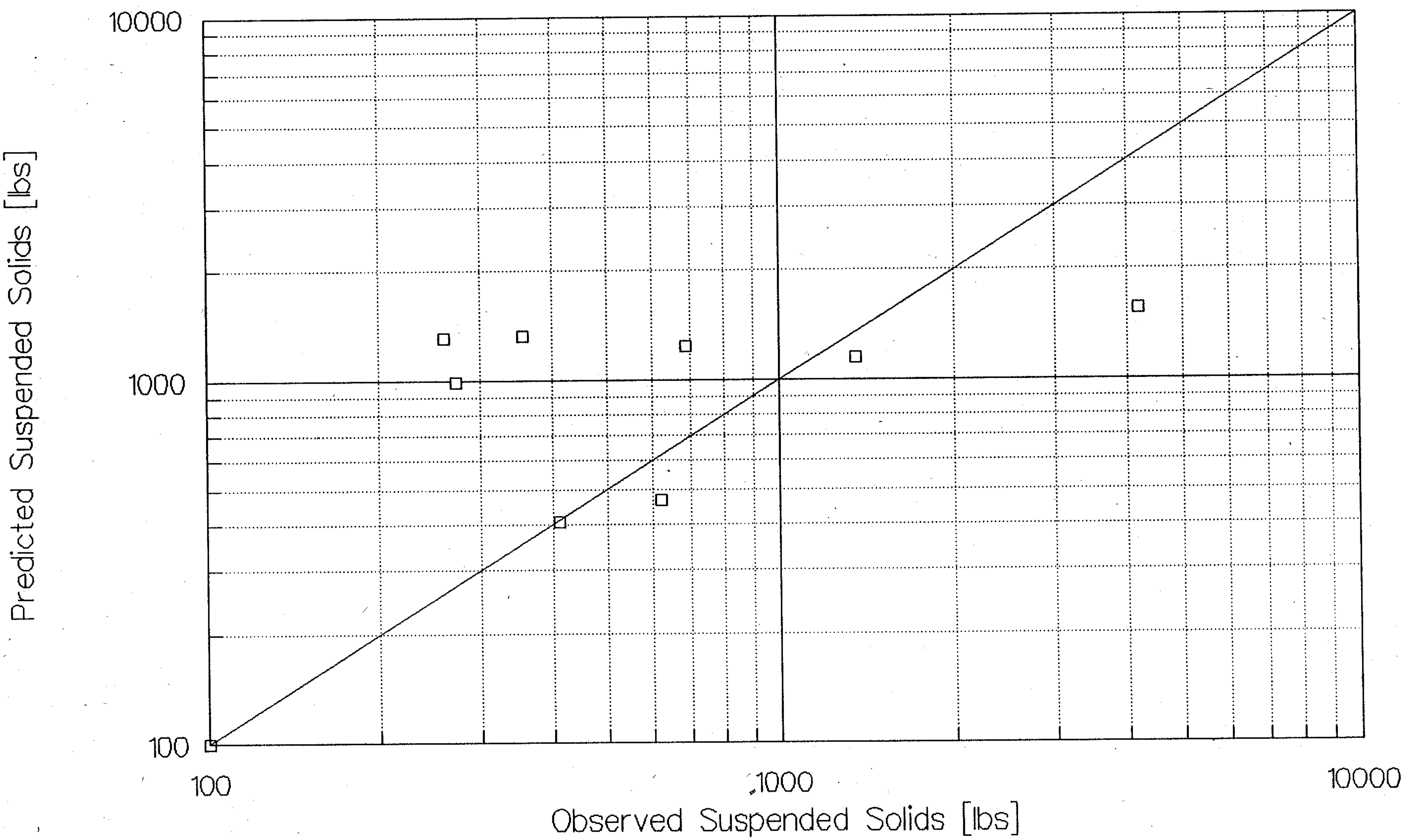
| A || B || C || S || T || U || V || W || X || Y || Z || AA |

Monroe Street Data
MONROE00.CAL w/MILW6.
Area(ac 244.95
Total Area Facto >>>>>
11/29/91
Solids Conv Factor(SCF

MONROE00.CAL w/MILW6.			Obsvd TSS	Obsvd TSS	Calc SS w/o Deliv	Calc SS w/ Deliv	SS Resid w/o Deliv	SS Resid w/ Deliv	% Diff	Outliers
CODE . # .	DATE	RAIN (in)	(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]		
1	910505	.84	42	259	1461	1313	-1202	-1054	-406.5%	*
3	910521	.06								
4	910525	.10								
5	910530	.12	848	619	607	467	12	152	24.6%	
6	910530	.11	404	412	537	406	-125	6	1.4%	
7	910610	.30	318	688	1501	1236	-813	-548	-79.7%	
8	910612	.55	89	356	1542	1330	-1186	-974	-273.1%	
9	910613	.32	186	272	1193	988	-921	-716	-263.4%	
10	910701	.27	672	1353	1412	1152	-59	201	14.8%	
11	910707	.67	680	4183	1781	1560	2402	2623	62.7%	
Maximum :		.84	848	4183	1781	1560	2402	2623		
Minimum :		.06	42	259	537	406	-1202	-1054		
Average :		.33	405	1018	1254	1057	-237	-39		
Count :		10	8	8	8	8	8	8		
Std.Dev.:		.25	281	1242	422	389	1101	1107		
Sum :		3.34	3239	8142	10034	8452	-1892	-310		
COV :		.76	.69	1.22	.34	.37				

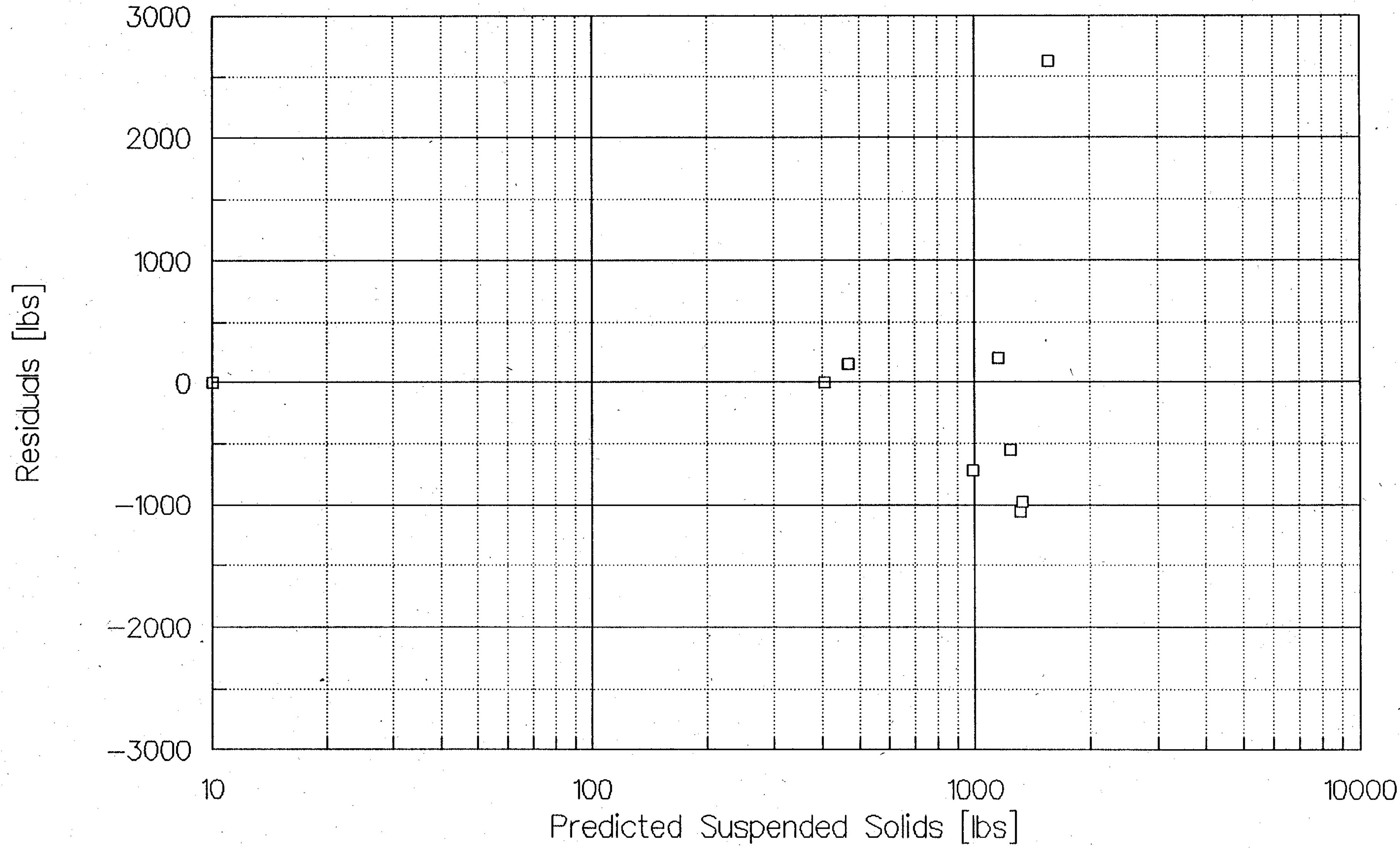
Monroe Street
Observed vs Calculated Suspended Solids

w/ Delivery at Outfall



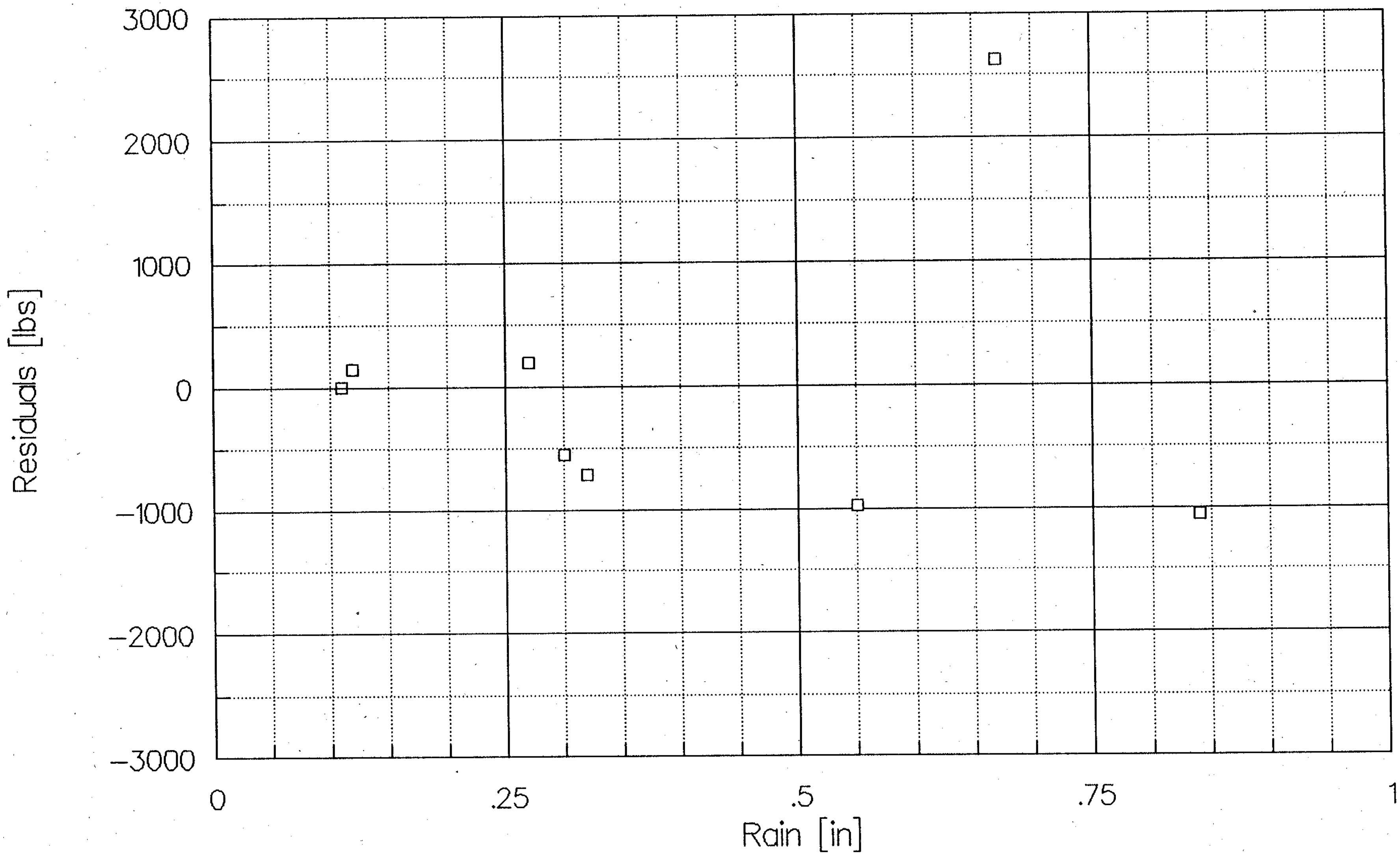
MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

Monroe Street
Predicted vs Residuals
w/ Delivery at Outfall



MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

Monroe Street Suspended Solids
Rain vs Residuals
w/ Delivery at Outfall



MONROE00.CAL w/MILW6.RSV, MILW11.PSC, DELIV2.PRR

| A || B || C || D || F || G || H || I || J || K || L || M || N || O |

Monroe Street Copper Analysis
Filename: MONROE4.CAL
Area(ac 244.95
Total Area Fac 889169
Solids Conv Factor(SCF): 6.2E-8
[1kg/10^9ug*2.204lbs/kg*1liter/0.264gal*1gal/0.1337ft^3*runoff[ft^3]*conc[ug/liter] =
= 6.244E-08*runoff[ft^3]*conc[ug/L] =>[lbs]

TOTAL RECOVERABLE COPPER CONCENTRATIONS, UG/L, at OUTFALL

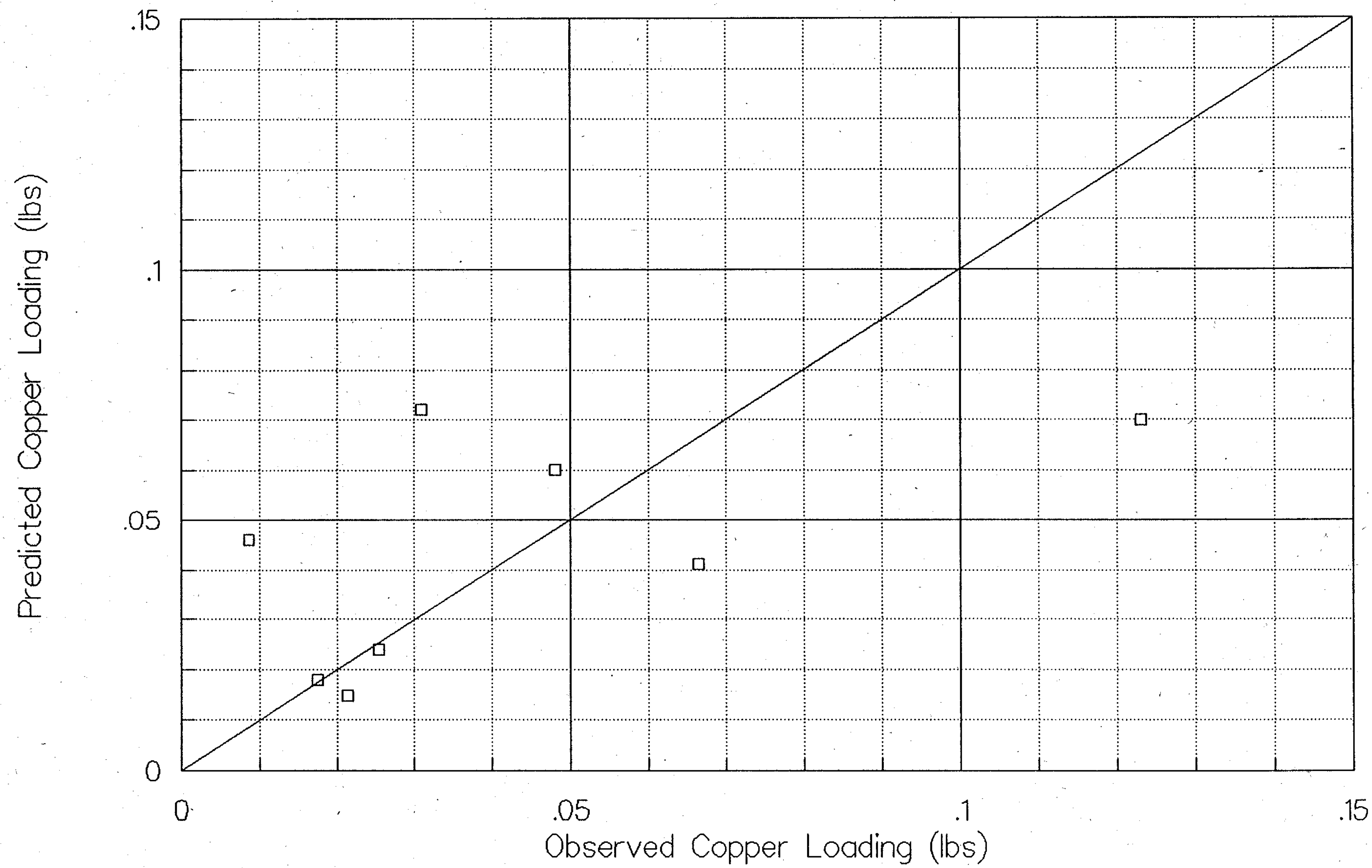
CODE . # .	DATE	RAIN INCHES	Obsrvd Runoff [ft^3]	Obsrvd Ttl Cu [ug/L]		Pred Ttl Cu [ug/L]	Obsrvd Ttl Cu [lbs]		Pred Ttl Cu [lbs]	
1	5/5/91	.84	98857	5	.70	9	.0309	-1.51	.072	-1.14
2	5/17/91	.1								
3	5/21/91	.06	1448							
4	5/25/91	.1	9242	44	1.64	38	.0254	-1.60	.024	-1.62
5	5/30/91	.12	11699	24	1.38	22	.0175	-1.76	.018	-1.74
6	5/30/91	.11	16317	21	1.32	21	.0214	-1.67	.015	-1.82
7	6/10/91	.3	34633	4	.60	19	.0086	-2.06	.046	-1.34
8	6/12/91	.55	64144	12	1.08	12	.0481	-1.32	.06	-1.22
10	7/1/91	.27	32234	33	1.52	19	.0664	-1.18	.041	-1.39
11	7/7/91	.67	98512	20	1.30	11	.1230	-.91	.07	-1.15
Count		10		8			8		8	
Minimun		.06		4			.0086		.0150	
Maximum		.84		44			.1230		.0720	
Average		.31		20			.0427		.0433	
Stnd Dev		.26		13			.0349		.0213	
COV		.85		.63			.82		.49	
Geo Mean				16			.0316		.0372	
Sum							.3413		.3460	

DISSOLVED COPPER, UG/L, at OUTFALL

CODE . # .	DATE	RAIN INCHES	Obsrvd Runoff [ft^3]	Obsrvd Dis Cu [ug/L]		Pred Dis Cu [ug/L]	Obsrvd Dis Cu [lbs]		Pred Dis Cu [lbs]	
1	5/5/91	.84	98857	3	.48	4	.0185	-1.73	.035	-1.46
2	5/17/91	.1								
3	5/21/91	.06	1448							
4	5/25/91	.1	9242	11	1.04	4	.0063	-2.20	.003	-2.52
5	5/30/91	.12	11699	10	1.00	4	.0073	-2.14	.003	-2.52
6	5/30/91	.11	16317	11	1.04	4	.0112	-1.95	.003	-2.52
7	6/10/91	.3	34633	2	.30	4	.0043	-2.36	.01	-2.00
8	6/12/91	.55	64144	6	.78	4	.0240	-1.62	.021	-1.68
10	7/1/91	.27	32234	8	.90	4	.0161	-1.79	.009	-2.05
11	7/7/91	.67	98512	2	.30	4	.0123	-1.91	.027	-1.57
Count		10		8			8		8	
Minimun		.06		2			.0043		.0030	
Maximum		.84		11			.0240		.0350	
Average		.31		7			.0125		.0139	
Stnd Dev		.26		4			.0063		.0115	
COV		.85		.55			.50		.83	
Geo Mean				5			.0109		.0091	
Sum							.1001		.1110	

	A	B	C	D	F	G	H	I	J	K	L	M	N	O
61														
62	PARTICULATE COPPER, UG/L, at OUTFALL													
63				Obsrvd	Obsrvd		Pred		Obsrvd		Pred			
64	CODE	DATE	RAIN	Runoff	Part Cu		Part Cu		Part Cu		Part Cu			
65	. # .		INCHES	[ft^3]	[ug/L]		[ug/L]		[lbs]		[lbs]			
66														
67	1	5/5/91	.84	98857	2	.30	5		.0123	-1.91	.037	-1.43		
68	2	5/17/91	.1		0									
69	3	5/21/91	.06	1448	0									
70	4	5/25/91	.1	9242	33	1.52	34		.0190	-1.72	.021	-1.68		
71	5	5/30/91	.12	11699	14	1.15	18		.0102	-1.99	.014	-1.85		
72	6	5/30/91	.11	16317	10	1.00	17		.0102	-1.99	.012	-1.92		
73	7	6/10/91	.3	34633	2	.30	15		.0043	-2.36	.036	-1.44		
74	8	6/12/91	.55	64144	6	.78	8		.0240	-1.62	.038	-1.42		
75	10	7/1/91	.27	32234	25	1.40	15		.0503	-1.30	.032	-1.49		
76	11	7/7/91	.67	98512	18	1.26	7		.1107	-.96	.043	-1.37		
77														
78	Count		10		10				8		8			
79	Minimun		.06		0				.0043		.0120			
80	Maximum		.84		33				.1107		.0430			
81	Average		.31		11				.0301		.0291			
82	Stnd Dev		.26		11				.0332		.0111			
83	COV		.85		.98				1.10		.38			
84	Geo Mean				9				.0186		.0265			
85	Sum								.2412		.2330			

Monroe Street Copper Analysis
Total Loading: Predicted vs. Observed



Filename: MONROE4.CAL

B11

Syene Road Study Area Results

SLAMM Calibration Data Summary Sheet

Site Data File Name: SYENE00.DAT

Syene Rd.	Observed	Predicted	Residuals
Runoff [in]			
Average	0.37	0.27	0.10
Std Dev	0.36	0.23	—
COV	0.96	0.84	—
Sum	4.12	2.97	1.15
Count	11		

Runoff - outliers [in]			
Average			
Std Dev			
COV			
Sum			
Count			

Rv			
Average	0.55	0.43	0.12
Std Dev	0.20	0.11	—
COV	0.37	0.25	—

SS w/Delivery [lbs]			
Average	958	1032	-74
Std Dev	809	609	—
COV	0.84	0.59	—
Sum	10536	11351	-815
Count	11		

SS w/Delivery - outliers [lbs]			
Average			
Std Dev			
COV			
Sum			
Count			

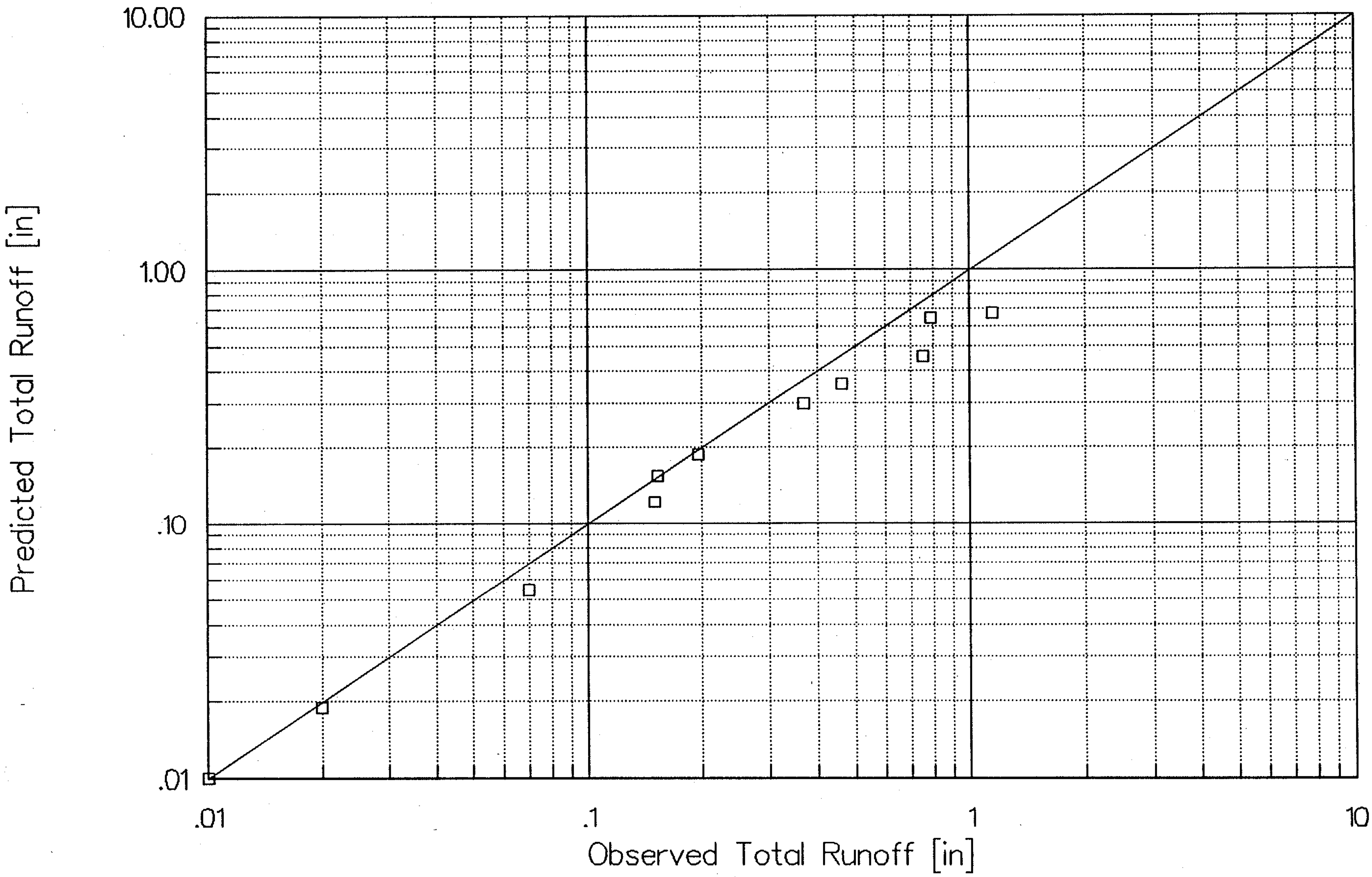
filename: DATASUM.WK1

JGV / RTB

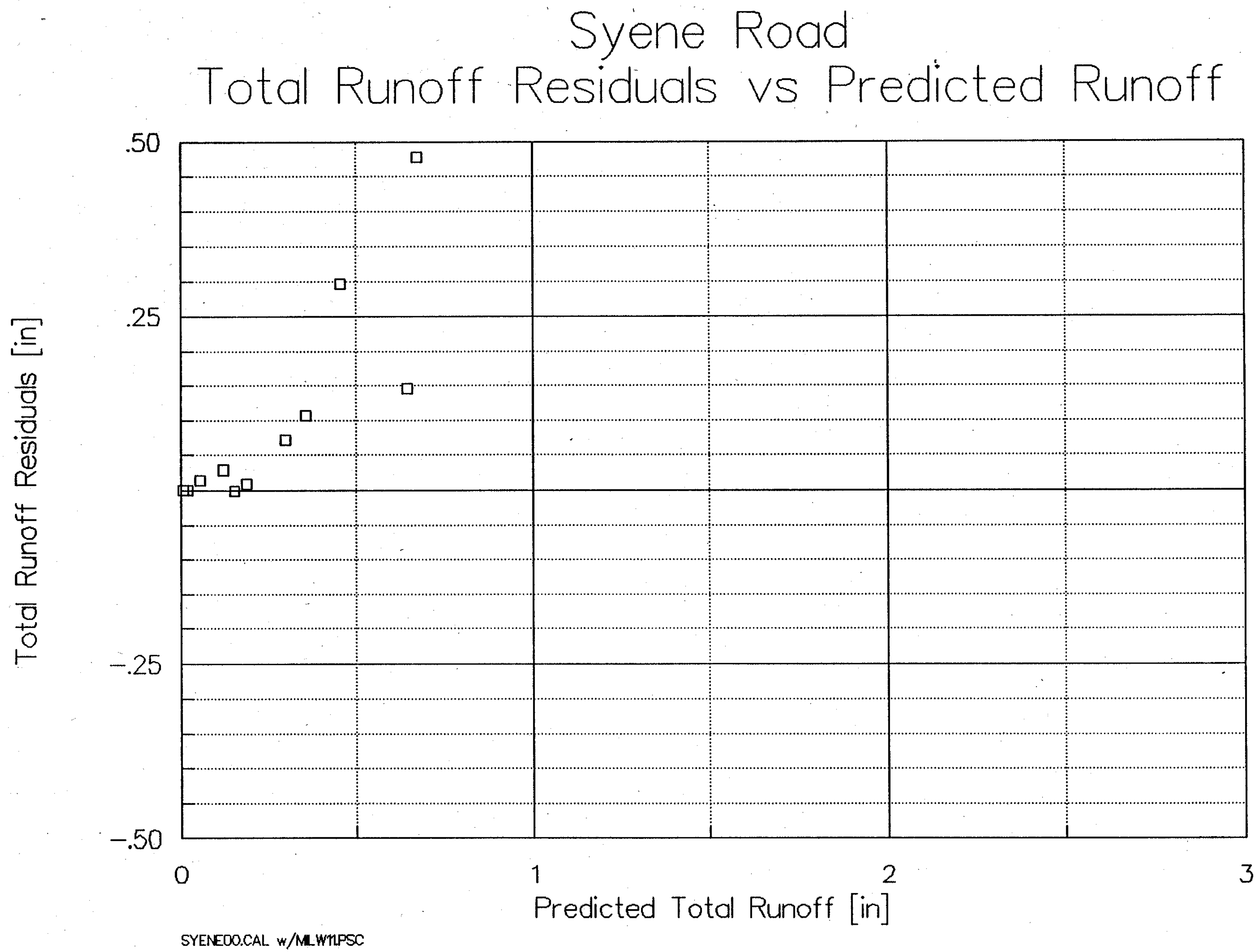
Syene Road Data Analysis
SYENE00.CAL w/MILW11.PSC
Area [acres]: 115.72
Area Factor: 420064
Solids Conversion Factor (SC 26.23
[1kg/10^6mg*2.204lbs/kg*1liter/0.264gal*1gal/0.1337ft^3*1ft/12in*area(acres)*43560ft^2/acre] = .2266*area

SYENE00.CAL w/MILW11.PSC			Obs Ttl	OBS TOTAL	SLAMM TOTAL	SLAMM TOTAL	RESID TOTAL	RESID TOTAL	RESID/ OBS TTL	OBS TOTAL	SLAMM TOTAL	RESID TOTAL	RESID/ OBS TTL
CODE	DATE	RAIN	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RUNOFF	RV	RV	RV	RV
. # .		(in)	(in)	(cu ft)	[in]	(cu ft)	[in]	(cu ft)	[ ]	(in/in)	(in/in)	(in/in)	[ ]
11	910408	1.22	.79	331567	.64	270475	.15	61092	.18	.65	.53	.12	.18
13	910412	1.27	1.15	482944	.67	282349	.48	200595	.42	.91	.53	.38	.41
14	910413	.89	.75	315722	.45	190960	.30	124762	.40	.84	.51	.33	.40
16	910505	.60	.37	154708	.30	124813	.07	29895	.19	.61	.50	.11	.19
16	910517	.07	.02	8372	.02	8013		359	.04	.28	.27	.01	.05
17	910518	.71	.46	194658	.36	149700	.11	44958	.23	.65	.50	.15	.23
18	910521	.15	.07	29274	.05	23099	.01	6175	.21	.46	.37	.09	.20
19	910525	.04	.01	3215	.01	3121		94	.03	.19	.19		.01
21	910610	.34	.15	64231	.15	64510		-279		.45	.45		
22	910612	.40	.20	82234	.19	78826	.01	3408	.04	.49	.47	.02	.04
23	610613	.28	.15	62979	.12	50969	.03	12010	.19	.54	.43	.11	.20
Minimum :		.04	.01	3215	.01	3121		-279		.19	.19		
Maximum :		1.27	1.15	482944	.67	282349	.48	200595	.42	.91	.53	.38	.41
Average :		.54	.37	157264	.27	113349	.10	43915	.18	.55	.43	.12	.17
Std.Dev.:		.42	.36	150278	.23	95148	.15	61372	.13	.20	.11	.12	.14
Count :		11	11	11	11	11	11	11	11	11	11	11	11
COV :		.77	.96	.96	.84	.84				.37	.25		
Sum :		5.97	4.12	1729904	2.97	1246835	1.15	483069	1.93				

Syene Road
Total Runoff — Predicted v Observed

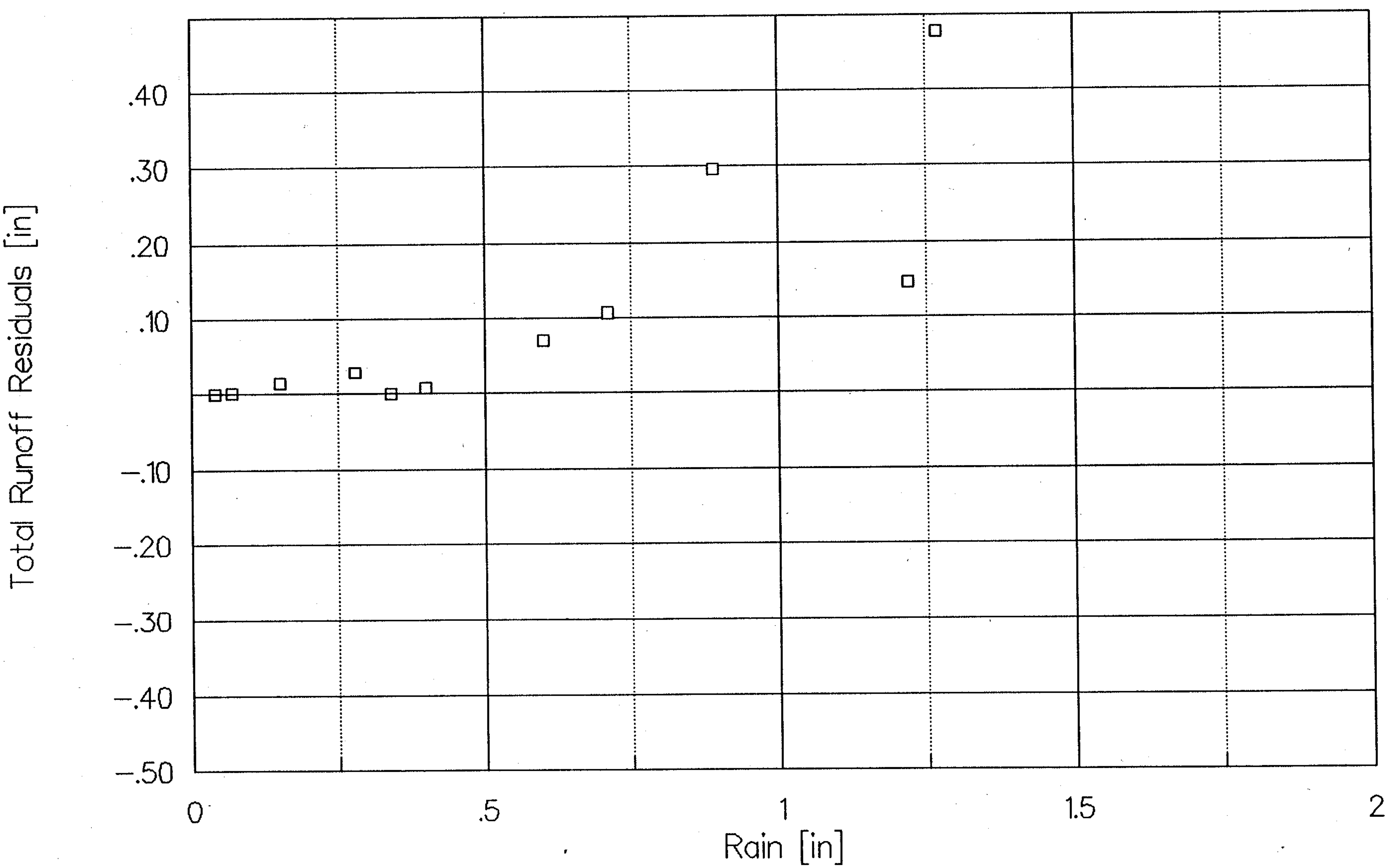


SYENE00.CAL w/MILW11.PSC



Syene Road
Total Runoff Residuals vs Predicted Runoff
.50
.25
-.25
-.50
Total Runoff Residuals [in]
0
1
2
3
Predicted Total Runoff [in]
SYENE00.CAL w/MLW11PSC

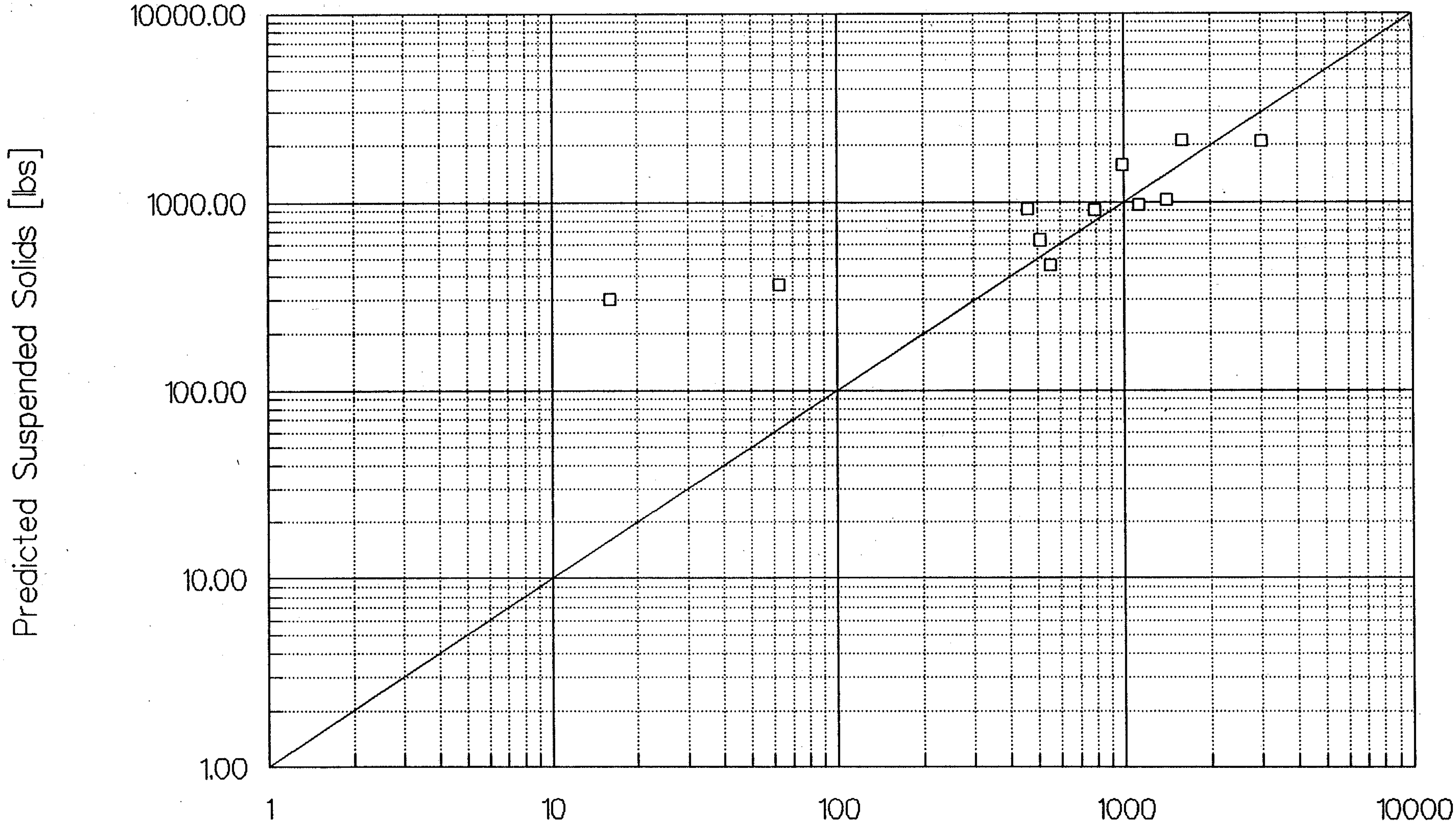
Syene Road
Total Runoff: Rain vs Residuals



SYENE00.CAL w/MLW11.PSC
Residuals = Observed - Predicted

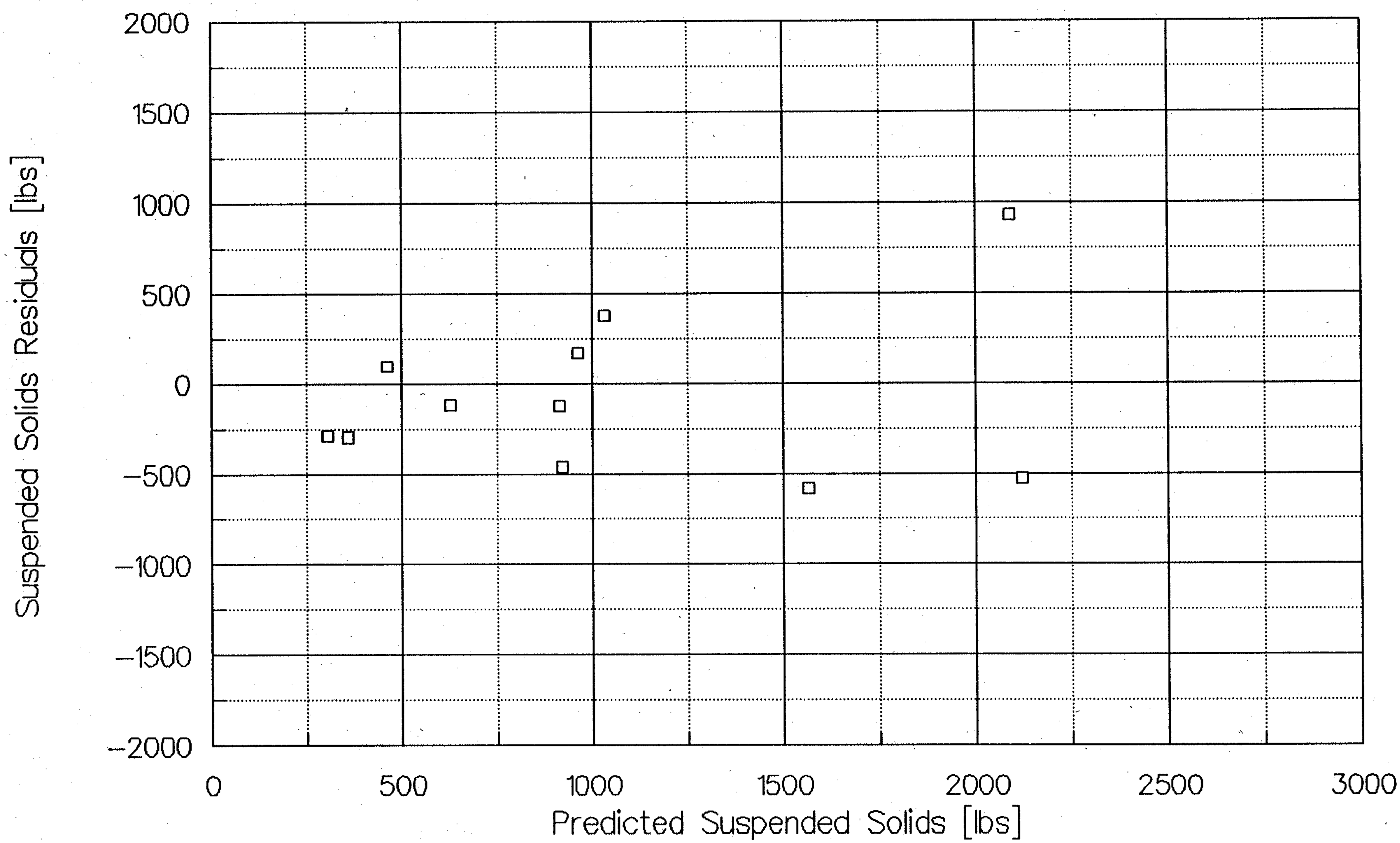
	A	B	C	S	T	U	V	W	X	Y	Z	AB
1	Syene Road Data Ana											
2	SYENE00.CAL w/MILW1											
3	Area [acres]: >>>>>											
4	Area Factor: >>>>>											
5	Solids Conversion F											
6	[1kg/10^6mg*2.204											
7												
8												
9												
10	SYENE00.CAL w/MILW1						Calc SS	Calc SS	SS Resid	SS Resid	SS Resid	
11					Obsrvd	Obsrvd						
12	CODE	DATE	RAIN		TSS	TSS	w/o Del	w/ Del	w/o Del	w/ Del	w/ Del	Outliers
13	. # .		(in)		(mg/l)	(lbs)	[lbs]	[lbs]	[lbs]	[lbs]	[ ]	
14												
15	11	910408	1.22		77	1594	2153	2118	-559	-524	.75	
16	13	910412	1.27		100	3016	2118	2087	898	929	1.44	
17	14	910413	.89		50	986	1618	1564	-632	-578	.63	
18	16	910505	.60		48	464	1000	922	-536	-458	.50	
19	16	910517	.07		120	63	558	360	-495	-297	.17	
20	17	910518	.71		116	1410	1093	1032	317	378	1.37	
21	18	910521	.15		304	556	621	461	-65	95	1.21	
22	19	910525	.04		80	16	503	305	-487	-289	.05	
23	21	910610	.34		282	1131	1134	963	-3	168	1.17	
24	22	910612	.40		154	791	1035	912	-244	-121	.87	
25	23	610613	.28		130	511	767	627	-256	-116	.82	
26												
27	Minimum :		.04		48	16	503	305	-632	-578		
28	Maximum :		1.27		304	3016	2153	2118	898	929		
29	Average :		.54		133	958	1145	1032	-188	-74		
30	Std.Dev.:		.42		82	809	556	609	440	426		
31	Count :		11		11	11	11	11	11	11		
32	COV :		.77		.62	.84	.49	.59				
33	Sum :		5.97		1461	10536	12600	11351	-2064	-815		

Syene Road
Suspended Solids — Predicted v Observed
w/ Delivery at Outfall



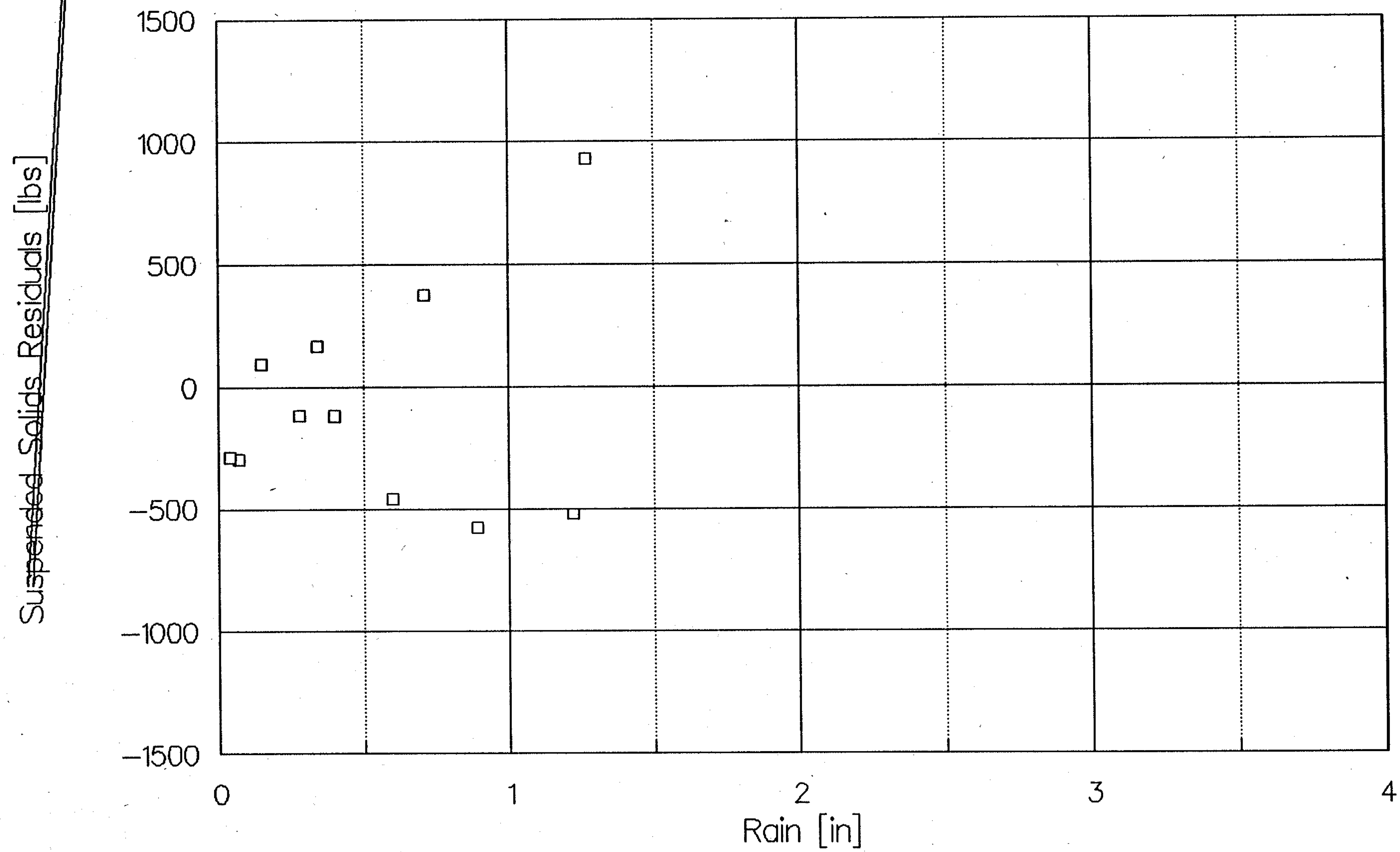
SYENE00.CAL w/MILW11.PSC

Syene Road
Suspended Solids: Residuals vs Predicted
w/ Delivery at Outfall



SYENE00.CAL w/MILW11.PSC

Syene Road
Suspended Solids: Residuals vs Rain
w/ Delivery at Outfall



SYENE00.CAL w/MILW11.PSC

| A || B || C || D | | F || G || H || I || J || K || L || M |

Syene Road Copper Analysis
Filename: SYENE9.CAL
Area(ac):
Total Area Fac .000
Solids Conv Factor(SCF): 6.2E-8
[1kg/10^9ug*2.204lbs/kg*1liter/0.264gal*1gal/0.1337ft^3*runoff[ft^3]*conc[ug/liter] =
= 6.244E-08*runoff[ft^3]*conc[ug/L] =>[lbs]

TOTAL RECOVERABLE COPPER CONCENTRATIONS, UG/L, at OUTFALL

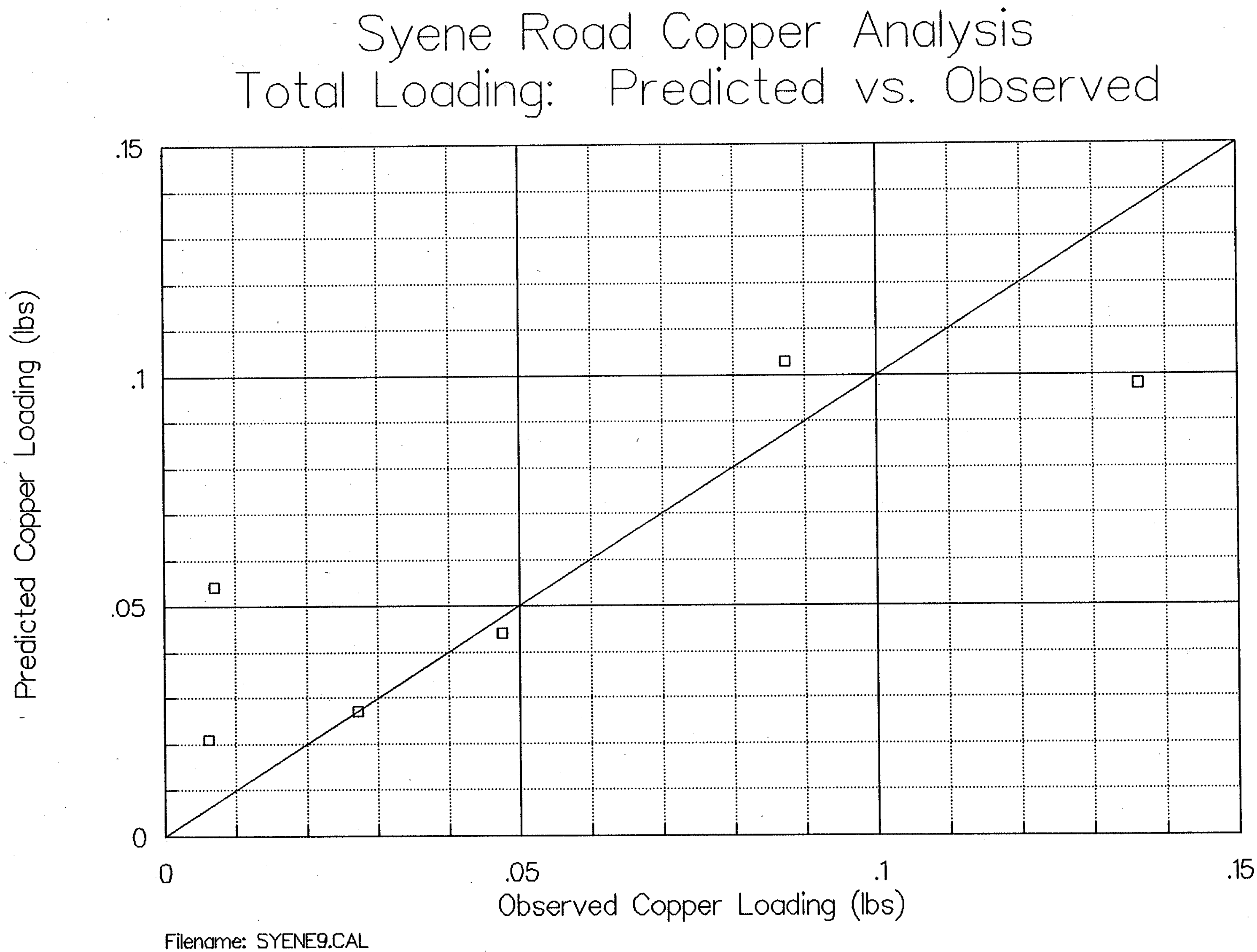
CODE . # .	DATE	RAIN INCHES	Obsrvd Runoff [ft^3]	Obsrvd Ttl Cu [ug/L]		Pred Ttl Cu [ug/L]	Obsrvd Ttl Cu [lbs]		Pred Ttl Cu [lbs]	
16.5	5/17/91	.07	8372	52	1.72	54	.0272	-1.57	.027	-1.57
18	5/21/91	.15	29274	26	1.41	30	.0475	-1.32	.044	-1.36
19	5/25/91	.04	3215	31	1.49	106	.0062	-2.21	.021	-1.68
21	6/10/91	.34	64231	34	1.53	24	.1364	-.87	.098	-1.01
22	6/12/91	.40	82234	17	1.23	21	.0873	-1.06	.103	-.99
24	7/1/91	.17	2051	55	1.74	32	.0070	-2.15	.054	-1.27
Count		6		6			6		6	
Minimun		.04		17			.0062		.021	
Maximum		.40		55			.1364		.103	
Average		.20		36			.0519		.058	
Stnd Dev		.13		14			.0468		.032	
COV		.68		.38			.90		.55	
Geo Mean				33			.0296		.049	
Sum							.3116		.347	

DISSOLVED COPPER, UG/L, at OUTFALL

CODE . # .	DATE	RAIN INCHES	Obsrvd Runoff [ft^3]	Obsrvd Dis Cu [ug/L]		Pred Dis Cu [ug/L]	Obsrvd Dis Cu [lbs]		Pred Dis Cu [lbs]	
16.5	5/17/91	.07	8372	33	1.52	13	.0173	-1.76	.006	-2.22
18	5/21/91	.15	29274	9	.95	11	.0165	-1.78	.016	-1.80
19	5/25/91	.04	3215	12	1.08	14	.0024	-2.62	.003	-2.52
21	6/10/91	.34	64231	12	1.08	11	.0481	-1.32	.044	-1.36
22	6/12/91	.40	82234	6	.78	11	.0308	-1.51	.053	-1.28
24	7/1/91	.17	2051	14	1.15	11	.0018	-2.75	.019	-1.72
Count		6		6			6		6	
Minimun		.04		6			.0018		.003	
Maximum		.40		33			.0481		.053	
Average		.20		14			.0195		.024	
Stnd Dev		.13		9			.0162		.019	
COV		.68		.61			.83		.79	
Geo Mean				12			.0110		.015	
Sum							.1168		.141	

PARTICULATE COPPER, UG/L, at OUTFALL

CODE . # .	DATE	RAIN INCHES	Obsrvd Runoff [ft^3]	Obsrvd Part Cu [ug/L]		Pred Part Cu [ug/L]	Obsrvd Part Cu [lbs]		Pred Part Cu [lbs]	
16.5	5/17/91	.07	8372	19	1.28	41	.0099	-2.00	.021	-1.68
18	5/21/91	.15	29274	17	1.23	19	.0311	-1.51	.027	-1.57
19	5/25/91	.04	3215	19	1.28	93	.0038	-2.42	.018	-1.74
21	6/10/91	.34	64231	22	1.34	13	.0882	-1.05	.054	-1.27
22	6/12/91	.40	82234	11	1.04	10	.0565	-1.25	.050	-1.30
24	7/1/91	.17	2051	41	1.61	21	.0053	-2.28	.035	-1.46
Count		6		6			6		6	
Minimun		.04		11			.0038		.018	
Maximum		.40		41			.0882		.054	
Average		.20		22			.0325		.034	
Stnd Dev		.13		9			.0310		.014	
COV		.68		.43			.95		.40	
Geo Mean				20			.0177		.031	
Sum							.1948		.205	


Syene Road Copper Analysis
Total Loading: Predicted vs. Observed
Predicted Copper Loading (lbs)
.15
.1
.05
0
0
.05
.1
.15
Observed Copper Loading (lbs)
Filename: SYENE9.CAL

Appendix C

Application Site Description Files and Results

Data file name: LILLYC.DAT
Rain file name: RAIN81.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 01/01/81
Date: 12-12-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW3.POL

Study period ending date: 12/31/81
Time: 11:13:03

Fraction of each type of Drainage System serving study area:

1. Grass Swales .3
2. Undeveloped roadside 0

Curb and Gutters, 'valleys', or sealed swales in:

3. Poor condition (or very flat) 0
4. Fair condition .7
5. Good condition (or very steep) 0

Site information: LILLY CREEK, MIXED LAND USES, SOURCE AREA LOADINGS FOR CALIB.

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	2.01	0.00	2.75	17.42	0.00
Roofs 2	5.29	0.00	0.37	0.98	0.00
Roofs 3	0.00	0.00	0.00	0.09	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.09	0.00	5.47	24.60	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.09	0.00	0.20	3.88	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	1.80	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	2.01	0.00	0.25	1.63	0.00
Driveways 2	2.10	0.00	0.00	0.18	0.00
Driveways 3	0.00	0.00	0.00	0.14	0.00
Sidewalks/Walks 1	0.32	0.00	0.57	0.49	0.09
Sidewalks/Walks 2	0.32	0.00	0.00	0.49	0.09
Street Area 1	2.01	0.00	1.19	6.14	1.11
Street Area 2	3.83	0.00	1.50	1.50	0.00
Street Area 3	0.55	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	2.49	0.18
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	4.01	0.00	0.03	3.30	27.26
Smll Lndscpd Area 1	68.11	0.00	0.78	6.58	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.18	0.00	0.00	0.00	0.29
Other Pervious Area	0.27	0.00	0.25	2.26	0.18
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	91.19	0.00	13.36	73.97	29.20

Freeway Source Area	Area (
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	

Total	

Total of All Source Areas 207.72

Total of All Source Areas less All Isolated Areas 207.25

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
The roof is pitched
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low

Paved Parking/Storage 1 Source area number: 6
The Source Area is directly connected or draining to a directly conntected area

Unpaved Parking/Storage 1 Source area number: 9
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low

Driveways 1 Source area number: 13
The Source Area is directly connected or draining to a directly conntected area

Driveways 2 Source area number: 14
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D

The building density is low
Sidewalks/Walks 1 Source area number: 16
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2 Source area number: 17
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low
Street Area 1 Source area number: 18
1. Street Texture: smooth
2. Total study area street length (curb-miles): 1.36
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .45
6. Equation coefficient B (intercept): 125
Street Area 2 Source area number: 19
1. Street Texture: intermediate
2. Total study area street length (curb-miles): 2.55
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450
Street Area 3 Source area number: 20
1. Street Texture: rough
2. Total study area street length (curb-miles): .18
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450
Undeveloped Area Source area number: 23
The SCS Hydrologic Soil Type is C/D
Smll Lndscpd Area 1 Source area number: 24
The SCS Hydrologic Soil Type is C/D
Other Pervious Area Source area number: 28
The SCS Hydrologic Soil Type is C/D

Commercial Areas
Roofs 1 Source area number: 61
The roof is flat
The Source Area is directly connected or draining to a directly conntected area
Roofs 2 Source area number: 62
The roof is pitched
The Source Area is directly connected or draining to a directly conntected area
Paved Parking/Storage 1 Source area number: 66
The Source Area is directly connected or draining to a directly conntected area
Unpaved Parking/Storage 1 Source area number: 69
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
Driveways 1 Source area number: 73
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 1 Source area number: 76
The Source Area is directly connected or draining to a directly conntected area
Street Area 1 Source area number: 78
1. Street Texture: smooth
2. Total study area street length (curb-miles): .47
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:

Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope): .71
6. Equation coefficient B (intercept): 70

Street Area 2 Source area number: 79
1. Street Texture: smooth
2. Total study area street length (curb-miles): .58
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope): .71
6. Equation coefficient B (intercept): 70

Undeveloped Area Source area number: 83
The SCS Hydrologic Soil Type is C/D
Smll Lndscpd Area 1 Source area number: 84
The SCS Hydrologic Soil Type is C/D
Other Pervious Area Source area number: 88
The SCS Hydrologic Soil Type is C/D

Industrial Areas
Roofs 1 Source area number: 91
The roof is flat
The Source Area is directly connected or draining to a directly conntected area
Roofs 2 Source area number: 92
The roof is flat
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low
Roofs 3 Source area number: 93
The roof is flat
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present
Paved Parking/Storage 1 Source area number: 96
The Source Area is directly connected or draining to a directly conntected area
Unpaved Parking/Storage 1 Source area number: 99
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low
Unpaved Parking/Storage 2 Source area number: 100
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present
Driveways 1 Source area number: 103
The Source Area is directly connected or draining to a directly conntected area
Driveways 2 Source area number: 104
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low
Driveways 3 Source area number: 105
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is medium or high
Alleys are not present
Sidewalks/Walks 1 Source area number: 106
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2 Source area number: 107
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low
Street Area 1 Source area number: 108
1. Street Texture: intermediate
2. Total study area street length (curb-miles): 2.9
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:

CHLYC.DAT

Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81   Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope):   .65
6. Equation coefficient B (intercept):   220
Street Area 2   Source area number: 109
1. Street Texture: smooth
2. Total study area street length (curb-miles): .62
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81   Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Medium
4. Parking controls imposed? No
5. Equation coefficient M (slope):   .71
6. Equation coefficient B (intercept):   70
Lrg Lndscpd Area 1   Source area number: 111
The SCS Hydrologic Soil Type is C/D
Undeveloped Area   Source area number: 113
The SCS Hydrologic Soil Type is C/D
Smll Lndscpd Area 1   Source area number: 114
The SCS Hydrologic Soil Type is C/D
Other Pervious Area   Source area number: 118
The SCS Hydrologic Soil Type is C/D

Open Space Areas
Sidewalks/Walks 1   Source area number: 136
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2   Source area number: 137
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
Street Area 1   Source area number: 138
1. Street Texture: smooth
2. Total study area street length (curb-miles): .67
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81   Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope):   .45
6. Equation coefficient B (intercept):   125
Lrg Lndscpd Area 1   Source area number: 141
The SCS Hydrologic Soil Type is C/D
Undeveloped Area   Source area number: 143
The SCS Hydrologic Soil Type is C/D
Other Pervious Area   Source area number: 148
The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls
Control Practice 1 : Grass Swale
1. Swale infiltration rate (inches per hour)= .25
2. Swale density (feet per acre)= 160
3. Wetted swale width (feet)= 3
4. Area served by swales (acres)= 62.175

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

LILLIC

Data File: LILLIC.DAT
Rain File: RAINR1.RAN
Date: 12-22-1991 Time: 23:06:53
Site description: LILLY CREEK, MIXED LAND USES, SOURCE AREA LOADINGS FOR CALIB.

Residential Areas - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Landscaped Area 1	Other Pervious Area	Land Use Totals	Rv	Total Losses (in.) #	Calculated CN
Summary for Runoff Producing Events																			
Minimum:	0.03	42	0	4	0	83	0	13	0	58	83	8	0	0	0	291	0.03	0.03	93.2
Maximum:	1.85	13323	8916	572	152	12783	3539	2035	539	11756	21295	3058	6758	114792	455	199974	0.33	1.24	99.0
Average:	0.40	2697	1352	117	23	2616	537	417	82	2082	3673	524	1024	17401	69	32613	0.25	0.30	
Totals:	30.36	204980	102716	8903	1748	198839	40776	31656	6213	158203	279177	39797	77862	1322486	5243	2478598			

Commercial Areas - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Sidewalks Walks 1	Street Area 1	Street Area 2	Undevel-oped Area Area	Small Landscaped Area 1	Other Pervious Area	Land Use Totals	Rv	Total Losses (in.) #	Calculated CN
Summary for Runoff Producing Events																
Minimum:	0.03	0	8	227	0	10	24	35	44	0	0	0	347	0.24	0.02	97.8
Maximum:	1.85	16510	2452	34787	1171	1590	3625	6960	8773	51	1315	421	77655	0.87	0.25	99.6
Average:	0.40	3075	496	7120	165	325	742	1232	1553	8	199	64	14980	0.77	0.09	
Totals:	30.36	233681	37733	541120	12531	24731	56387	93662	118062	583	15145	4854	1138490			

Industrial Areas - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Roofs 3	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Unpaved Parking/ Storage 2	Drive-ways 1	Drive-ways 2	Drive-ways 3	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Large Landscaped Area 1	Undevel-oped Area Area	Small Landscaped Area 1	Other Pervious Area	Land Use Totals	Rv	Total Losses (in.) #	Calculated CN
Summary for Runoff Producing Events																						
Minimum:	0.03	0	0	0	1021	0	0	68	0	0	20	0	132	44	0	0	0	0	1285	0.16	0.03	94.8
Maximum:	1.85	104581	1652	141	156444	6539	2779	10366	303	232	3116	826	34139	8773	4197	5562	11090	3809	354550	0.71	0.53	99.4
Average:	0.40	19477	250	20	32020	991	329	2122	46	35	638	125	5889	1553	636	843	1681	577	67234	0.63	0.15	
Totals:	30.36	1480263	19029	1505	2433557	75338	25038	161248	3495	2622	48473	9514	447558	118062	48348	64076	127763	43882	5109770			

Open Space Areas - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Landscaped Area 1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals	Rv	Total Losses (in.) #	Calculated CN
Summary for Runoff Producing Events											
Minimum:	0.03	4	0	32	0	0	0	36	0.01	0.03	81.0
Maximum:	1.85	572	152	6492	303	45944	303	53767	0.28	1.34	98.8
Average:	0.40	117	23	1150	46	6965	46	8346	0.20	0.32	
Totals:	30.36	6903	1748	87366	3495	529305	3495	634312			

Total Area, with Drainage and Outfall Controls - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Rv	Total Losses (in) #	Calculatd CN	Peak Reduction Factor	Flushing Ratio	Detention Basin Outlet Structure Failed (land use #-source area #)
Summary for Runoff Producing Events											
Number of Runoff Producing Rains:		76	76	76	76	76					
Minimum:	0.03	1959	1371	0.0	1371	0.06	0.03	88.6			
Maximum:	1.85	685946	662242	0.0	662242	0.48	0.97	99.2			
Average:	0.40	123173	120007	0.0	120007	0.40	0.24				

* Total losses are summarized for all events, not for runoff producing events alone.
##

Residential Areas - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	9	12	57	377	57	57	9	12	66	85	21	250	63	158	65
Maximum:	1.85	12	12	984	440	276	274	12	12	9936	12209	3555	250	63	158	5426
Fl Wt Ave:	0.40	12	12	99	395	67	70	12	12	427	481	123	250	63	158	136

Commercial Areas - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Sidewalks Walks 1	Street Area 1	Street Area 2	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events													
Minimum:	0.03	5	4	95	600	92	38	308	302	600	300	250	126
Maximum:	1.85	5	5	1618	2984	400	50	33210	32513	3274	300	250	6219
Fl Wt Ave:	0.40	5	5	153	807	138	50	1717	1681	787	300	250	414

Industrial Areas - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Roofs 3	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Unpaved Parking/ Storage 2	Drive-ways 1	Drive-ways 2	Drive-ways 3	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Large Lndscaped Area 1	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																			
Minimum:	0.03	5	5	5	95	300	300	100	100	100	100	100	382	323	300	500	300	250	124
Maximum:	1.85	5	5	5	1618	2476	1492	298	149	149	298	149	53338	34755	300	500	300	250	7691
Fl Wt Ave:	0.40	5	5	5	163	497	389	104	100	100	104	100	2297	1796	300	500	300	250	347

Open Space Areas - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Lndscaped Area 1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	38	50	59	300	500	250	439
Maximum:	1.85	50	50	7972	300	500	250	7149
Fl Wt Ave:	0.40	50	50	381	300	500	250	474

Total Area, with Drainage and Outfall Controls - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	131	76	0.0	76	
Maximum:	1.85	7431	170	0.0	170	
Fl Wt Ave:	0.40	308	137	0.0	137	

##

Residential Areas - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	0	0	0	0	1	0	0	0	17	34	2	0	0	0	53
Maximum:	1.85	10	7	2	4	45	13	2	0	101	190	5	105	451	4	910

LILLYC 3/3

Commercial Areas - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Sidewalks Walks 1	Street Area 1	Street Area 2	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events													
Minimum:	0.03	0	0	18	0	0	0	49	61	0	0	0	127
Maximum:	1.85	5	1	208	44	9	11	200	247	2	25	7	626
Fl Wt Ave:	0.40	2	0	104	24	5	5	150	185	1	11	3	437
Total:	30.36	73	12	5509	631	213	176	10029	12376	29	283	76	29406

Industrial Areas - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Roofs 3	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Unpaved Parking/ Storage 2	Drive-ways 1	Drive-ways 2	Drive-ways 3	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Large Lndscaped Area 1	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																			
Minimum:	0.03	0	0	0	79	0	0	1	0	0	0	0	391	65	0	0	0	0	466
Maximum:	1.85	33	1	0	927	122	52	65	2	1	19	5	1236	254	79	173	208	59	2736
Fl Wt Ave:	0.40	15	0	0	468	64	26	29	1	1	9	2	923	198	36	79	94	27	1746
Total:	30.36	462	6	0	24772	2338	608	1051	22	16	316	59	61625	13230	905	1998	2391	684	116484

Open Space Areas - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Lndscaped Area 1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	0	0	8	0	0	0	8
Maximum:	1.85	2	0	50	6	1433	5	1470
Fl Wt Ave:	0.40	1	0	31	3	649	2	676
Total:	30.36	28	5	2076	65	16509	55	18757

Total Area, with Drainage and Outfall Controls - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	635	8	0.0	8	
Maximum:	1.85	5624	5350	0.0	5350	
Fl Wt Ave:	0.40	3550	2596	0.0	2596	
Total:	30.36	179690	77858		77858	

##

Residential Areas - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	3	4	9	104	6	6	4	4	5	6	4	18	4	6	5
Maximum:	1.85	4	4	90	112	14	14	4	4	183	248	75	18	4	6	114
Fl Wt Ave:	0.40	4	4	13	107	7	7	4	4	13	14	6	18	4	6	4

Commercial Areas - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Sidewalks Walks 1	Street Area 1	Street Area 2	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events													
Minimum:	0.03	7	6	12	138	13	5	30	29	44	5	10	16
Maximum:	1.85	7	7	145	497	56	6	2332	2283	239	5	10	599
Fl Wt Ave:	0.40	7	7	18	169	19	6	128	126	57	5	10	36

Industrial Areas - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Roofs 3	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Unpaved Parking/ Storage 2	Drive-ways 1	Drive-ways 2	Drive-ways 3	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Large Lndscaped Area 1	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																			
Minimum:	0.03	3	3	3	21	33	33	12	12	12	96	90	40	37	11	112	11	31	19
Maximum:	1.85	3	3	3	112	184	104	19	14	14	159	109	3111	2033	11	112	11	31	464
Fl Wt Ave:	0.40	3	3	3	25	45	38	13	13	13	92	90	146	122	11	112	11	31	32

Open Space Areas - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Lndscaped Area 1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	21	23	22	12	36	10	34
Maximum:	1.85	23	23	2989	12	36	10	2680
Fl Wt Ave:	0.40	23	23	143	12	36	10	51

Total Area, with Drainage and Outfall Controls - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	16	15	0.0	15	
Maximum:	1.85	476	20	0.0	20	
Fl Wt Ave:	0.40	27	16	0.0	16	

##

Residential Areas - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.051
Maximum:	1.85	0.003	0.002	0.000	0.001	0.005	0.001	0.001	0.000	0.004	0.008	0.001	0.008	0.029	0.000	0.062

UILLYC 5/5

Commercial Areas - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Sidewalks Walks 1	Street Area 1	Street Area 2	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events													
Minimum:	0.03	0.000	0.000	0.002	0.000	0.000	0.000	0.003	0.004	0.000	0.000	0.000	0.009
Maximum:	1.85	0.007	0.001	0.027	0.010	0.001	0.001	0.015	0.018	0.000	0.000	0.000	0.077
Fl Wt Ave:	0.40	0.003	0.000	0.013	0.005	0.001	0.001	0.012	0.015	0.000	0.000	0.000	0.049
Totals:	30.36	0.096	0.016	0.614	0.132	0.030	0.021	0.749	0.925	0.002	0.065	0.003	2.592

Industrial Areas - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Roofs 3	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Unpaved Parking/ Storage 2	Drive-ways 1	Drive-ways 2	Drive-ways 3	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Large Lndscaped Area 1	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																			
Minimum:	0.03	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.004	0.000	0.000	0.000	0.000	0.027
Maximum:	1.85	0.016	0.000	0.000	0.202	0.013	0.006	0.008	0.000	0.000	0.017	0.005	0.090	0.021	0.003	0.039	0.007	0.007	0.431
Fl Wt Ave:	0.40	0.007	0.000	0.000	0.094	0.007	0.003	0.004	0.000	0.000	0.008	0.002	0.070	0.016	0.001	0.018	0.003	0.003	0.234
Total:	30.36	0.233	0.003	0.000	3.764	0.211	0.069	0.127	0.003	0.002	0.277	0.053	4.077	0.506	0.033	0.448	0.086	0.686	10.362

Open Space Areas - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Lndscaped Area_1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	0.000	0.000	0.003	0.000	0.000	0.000	0.003
Maximum:	1.85	0.001	0.000	0.019	0.000	0.105	0.000	0.115
Fl Wt Ave:	0.40	0.000	0.000	0.012	0.000	0.047	0.000	0.059
Total:	30.36	0.013	0.002	0.778	0.003	1.205	0.002	2.003

Total Area, with Drainage and Outfall Controls - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	0.041	0.001	0.0	0.001	
Maximum:	1.85	0.695	0.656	0.0	0.656	
Fl Wt Ave:	0.40	0.373	0.310	0.0	0.310	
Total:	30.36	15.962	9.389		9.389	

##

Data file name: LILLYG.DAT
Rain file name: RAIN81.RAN
Runoff Coefficient file name: MILW6.RSV
Particulate Residue Delivery file name: DELIV2.PRR
Study period starting date: 01/01/81
Date: 12-12-1991

Particulate Solids Concentration file name: MILW11.PSC
Pollutant Relative Concentration file name: MILW3.POL

Study period ending date: 12/31/81
Time: 11:14:18

Fraction of each type of Drainage System serving study area:

1. Grass Swales .3
2. Undeveloped roadside 0

   Curb and Gutters, 'valleys', or sealed swales in:

   3. Poor condition (or very flat) 0
   4. Fair condition .7
   5. Good condition (or very steep) 0

Site information: LILLY CREEK, LOW DENSITY RES., SOURCE LOADINGS FOR MODEL CALIB.

Areas for each Source (acres)

Source Area	Residential Areas	Institutional Areas	Commercial Areas	Industrial Areas	Open Spaces Areas
Roofs 1	1.43	0.00	0.00	0.00	0.00
Roofs 2	3.77	0.00	0.00	0.00	0.00
Roofs 3	0.00	0.00	0.00	0.00	0.00
Roofs 4	0.00	0.00	0.00	0.00	0.00
Roofs 5	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.06	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Paved Parking/Storage	0.00	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.06	0.00	0.00	0.00	0.00
Unpaved Parking/Storag	0.00	0.00	0.00	0.00	0.00
Playground 1	0.00	0.00	0.00	0.00	0.00
Playground 2	0.00	0.00	0.00	0.00	0.00
Driveways 1	1.50	0.00	0.00	0.00	0.00
Driveways 2	1.43	0.00	0.00	0.00	0.00
Driveways 3	0.00	0.00	0.00	0.00	0.00
Sidewalks/Walks 1	0.23	0.00	0.00	0.00	0.01
Sidewalks/Walks 2	0.23	0.00	0.00	0.00	0.01
Street Area 1	1.43	0.00	0.00	0.00	0.08
Street Area 2	2.73	0.00	0.00	0.00	0.00
Street Area 3	0.39	0.00	0.00	0.00	0.00
Lrg Lndscpd Area 1	0.00	0.00	0.00	0.00	0.01
Lrg Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Undeveloped Area	2.86	0.00	0.00	0.00	1.87
Smll Lndscpd Area 1	48.56	0.00	0.00	0.00	0.00
Smll Lndscpd Area 2	0.00	0.00	0.00	0.00	0.00
Smll Lndscpd Area 3	0.00	0.00	0.00	0.00	0.00
Isolated Area	0.13	0.00	0.00	0.00	0.02
Other Pervious Area	0.20	0.00	0.00	0.00	0.01
Other Directly Connect	0.00	0.00	0.00	0.00	0.00
Other Partially Connec	0.00	0.00	0.00	0.00	0.00
Total	65.02	0.00	0.00	0.00	2.00

Freeway Source Area	Area
Paved Lane & Shoulder Area 1	
Paved Lane & Shoulder Area 2	
Paved Lane & Shoulder Area 3	
Paved Lane & Shoulder Area 4	
Paved Lane & Shoulder Area 5	
Large Turf Areas	
Undeveloped Areas	
Other Pervious Areas	
Other Directly Connected Imperv Area	
Other Partially Connected Imperv Area	
Total	

Total of All Source Areas 67.02

Total of All Source Areas less All Isolated Areas 66.87

Source Area Control Practice Information

Residential Areas

Roofs 1 Source area number: 1
- The roof is pitched
- The Source Area is directly connected or draining to a directly conntected area

Roofs 2 Source area number: 2
- The roof is pitched
- The Source Area is draining to a pervious area (partially connected impervious area)
- The SCS Hydrologic Soil Type is C/D
- The building density is low

Paved Parking/Storage 1 Source area number: 6
- The Source Area is directly connected or draining to a directly conntected area

Unpaved Parking/Storage 1 Source area number: 9
- The Source Area is draining to a pervious area (partially connected impervious area)
- The SCS Hydrologic Soil Type is C/D
- The building density is low

Driveways 1 Source area number: 13
- The Source Area is draining to a pervious area (partially connected impervious area)
- The SCS Hydrologic Soil Type is C/D
- The building density is low

Driveways 2 Source area number: 14

The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 1 Source area number: 16
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2 Source area number: 17
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
The building density is low
Street Area 1 Source area number: 18
1. Street Texture: smooth
2. Total study area street length (curb-miles): .98
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .45
6. Equation coefficient B (intercept): 125
Street Area 2 Source area number: 19
1. Street Texture: intermediate
2. Total study area street length (curb-miles): 1.82
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450
Street Area 3 Source area number: 20
1. Street Texture: rough
2. Total study area street length (curb-miles): .13
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .3
6. Equation coefficient B (intercept): 450
Undeveloped Area Source area number: 23
The SCS Hydrologic Soil Type is C/D
Smll Lndscpd Area 1 Source area number: 24
The SCS Hydrologic Soil Type is C/D
Other Pervious Area Source area number: 28
The SCS Hydrologic Soil Type is C/D

Open Space Areas
Sidewalks/Walks 1 Source area number: 136
The Source Area is directly connected or draining to a directly conntected area
Sidewalks/Walks 2 Source area number: 137
The Source Area is draining to a pervious area (partially connected impervious area)
The SCS Hydrologic Soil Type is C/D
Street Area 1 Source area number: 138
1. Street Texture: smooth
2. Total study area street length (curb-miles): .05
3. Initial Street Dirt Loading (lbs/curb-mi): default value
4. Street Dirt Accumulation:
Default value used
Control Practice: Street Cleaning
1. Street cleaning schedule:
Begin cleaning on: 04/01/81 Schedule: Every 12 weeks (Wed)
Final cleaning period ending date: 10/30/81
2. Street cleaner productivity: Default
3. Parking density: Light
4. Parking controls imposed? No
5. Equation coefficient M (slope): .45
6. Equation coefficient B (intercept): 125

LILRG.DAT

Lrg Lndscpd Area 1 Source area number: 141
The SCS Hydrologic Soil Type is C/D
Undeveloped Area Source area number: 143
The SCS Hydrologic Soil Type is C/D
Other Pervious Area Source area number: 148
The SCS Hydrologic Soil Type is C/D

Catchbasin or Drainage Controls
Control Practice 1 : Grass Swale
1. Swale infiltration rate (inches per hour)= .25
2. Swale density (feet per acre)= 160
3. Wetted swale width (feet)= 3
4. Area served by swales (acres)= 20.0616

Outfall Controls

Pollutants to be Analyzed and Printed:

Pollutant Name	Pollutant Type
Residue	Particulate

LILLY6 1/3

Data File: LILLY6.DAT
Rain File: RAIN81.RAN
Date: 12-22-1991 Time: 23:20:39
Site description: LILLY CREEK, LOW DENSITY RES., SOURCE LOADINGS FOR MODEL CALIB.

Residential Areas - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive- ways 1	Drive- ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel- oped Area Area	Small Ldscaped Area 1	Other Pervious Area	Land Use Totals	Rv	Total Losses (in.) *	Calculated CN
Summary for Runoff Producing Events																			
Minimum:	0.03	30	0	3	0	0	59	10	0	42	59	6	0	0	0	207	0.03	0.03	83.2
Maximum:	1.85	9478	6354	413	110	2528	9094	1453	388	8364	15179	2168	4820	81843	337	142539	0.33	1.24	99.0
Average:	0.40	1919	963	85	17	383	1861	299	59	1481	2618	371	731	12406	51	23245	0.25	0.30	
Totals:	30.36	145831	73202	6430	1262	29125	141463	22753	4466	112552	198996	28220	55532	942986	3883	1766602			

Open Space Areas - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Ldscaped Area 1	Undevel- oped Area Area	Other Pervious Area	Land Use Totals	Rv	Total Losses (in.) *	Calculated CN
Summary for Runoff Producing Events											
Minimum:	0.03	0	0	2	0	0	0	3	0.01	0.03	81.1
Maximum:	1.85	38	10	468	17	3152	17	3702	0.28	1.34	98.8
Average:	0.40	8	2	83	3	478	3	575	0.20	0.32	
Totals:	30.36	594	117	6297	194	36310	194	43705			

Total Area, with Drainage and Outfall Controls - Runoff Volume (cu. ft)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch- basin Volume % Full	Total With Outfall Controls	Rv	Total Losses (in) *	Calculatd CN	Peak Reduction Factor	Flushing Ratio	Detention Basin Outlet Structure Failed (land use B- source area B)
Summary for Runoff Producing Events											
Number of Runoff Prod- ucing Rains:		76	76	76	76	76					
Minimum:	0.03	210	147	0.0	147	0.02	0.03	82.4			
Maximum:	1.85	146241	138592	0.0	138592	0.31	1.28	98.9			
Average:	0.40	23820	22860	0.0	22860	0.24	0.31				
Total:	30.36	1810308	1737369		1737369						

* Total losses are summarized for all events, not for runoff producing events alone.
##

Residential Areas - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive- ways 1	Drive- ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel- oped Area Area	Small Ldscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	9	12	57	377	57	57	9	12	67	86	22	250	63	158	65
Maximum:	1.85	12	12	984	440	274	276	12	12	9051	12225	3621	250	63	158	5455
Fl Wt Ave:	0.40	12	12	99	395	70	87	12	12	432	481	126	250	63	158	136

Open Space Areas - Concentration of PARTICULATE RESIDUE (mg/L)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Ldscaped Area 1	Undevel- oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	38	50	61	300	500	250	437
Maximum:	1.85	50	50	8255	300	500	250	7460
Fl Wt Ave:	0.40	50	50	394	300	500	250	475

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	74	44	0.0	44	
Maximum:	1.85	5480	93	0.0	93	
Fl Wt Ave:	0.40	144	73	0.0	73	

##

Residential Areas - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	0	0	0	0	0	1	0	0	12	24	1	0	0	0	38
Maximum:	1.85	7	5	1	3	9	32	1	0	73	136	4	75	322	3	578
Fl Wt Ave:	0.40	3	2	1	1	4	16	0	0	46	91	3	34	146	2	344
Totals:	30.36	107	55	40	31	127	772	17	3	3036	5975	221	866	3705	38	14996

Open Space Areas - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Lndscaped Area 1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	0	0	1	0	0	0	1
Maximum:	1.85	0	0	4	0	98	0	101
Fl Wt Ave:	0.40	0	0	2	0	45	0	47
Totals:	30.36	2	0	155	4	1132	3	1296

Total Area, with Drainage and Outfall Controls - Yield of PARTICULATE RESIDUE (lbs)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	39	0	0.0	0	
Maximum:	1.85	679	634	0.0	634	
Fl Wt Ave:	0.40	390	299	0.0	299	
Total:	30.36	16292	7887		7887	

##

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Residential Areas - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	3	4	9	104	6	6	4	4	5	6	4	18	4	6	5
Maximum:	1.85	4	4	90	113	14	14	4	4	185	249	76	18	4	6	115
Fl Wt Ave:	0.40	4	4	13	107	7	7	4	4	13	14	7	18	4	6	23

Open Space Areas - Concentration of TOTAL COPPER (micrograms/L)

Start	Rain	Sidewalks	Sidewalks	Street	Large	Undevel-	Other	Land

LILLY6 3/3

Summary for Runoff Producing Events

Minimum:	0.03	21	23	23	12	36	10	34
Maximum:	1.85	23	23	3094	12	36	10	2797
Fl Wt Ave:	0.40	23	23	140	12	36	10	52

Total Area, with Drainage and Outfall Controls - Concentration of TOTAL COPPER (micrograms/L)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Part. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	6	5	0.0	5	
Maximum:	1.85	148	6	0.0	6	
Fl Wt Ave:	0.40	8	6	0.0	6	

##

Residential Areas - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Roofs 1	Roofs 2	Paved Parking/ Storage 1	Unpaved Parking/ Storage 1	Drive-ways 1	Drive-ways 2	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Street Area 2	Street Area 3	Undevel-oped Area Area	Small Lndscaped Area 1	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events																
Minimum:	0.03	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Maximum:	1.85	0.002	0.001	0.000	0.001	0.001	0.003	0.000	0.000	0.003	0.006	0.001	0.005	0.070	0.000	0.044
Fl Wt Ave:	0.40	0.001	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.002	0.003	0.000	0.002	0.009	0.000	0.022
Total:	30.36	0.033	0.016	0.005	0.008	0.012	0.065	0.006	0.001	0.089	0.169	0.011	0.063	0.236	0.001	0.717

Open Space Areas - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Sidewalks Walks 1	Sidewalks /Walks 2	Street Area 1	Large Lndscaped Area 1	Undevel-oped Area Area	Other Pervious Area	Land Use Totals
Summary for Runoff Producing Events								
Minimum:	0.03	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Maximum:	1.85	0.000	0.000	0.001	0.000	0.007	0.000	0.008
Fl Wt Ave:	0.40	0.000	0.000	0.001	0.000	0.003	0.000	0.004
Total:	30.36	0.001	0.000	0.058	0.000	0.093	0.000	0.142

Total Area, with Drainage and Outfall Controls - Yield of TOTAL COPPER (lbs)

Start Date	Rain Total (inches)	Total Without Drainage Controls	Total With Drainage Controls	Catch-basin Volume % Full	Total With Outfall Controls	Flow-wtd Min. Fart. Size Controlled
Summary for Runoff Producing Events						
Number of Runoff Producing Rains:		76	76	76	76	
Minimum:	0.03	0.001	0.000	0.0	0.000	
Maximum:	1.85	0.052	0.049	0.0	0.049	
Fl Wt Ave:	0.40	0.020	0.022	0.0	0.022	
Total:	30.36	0.859	0.599		0.599	

##

Appendix D

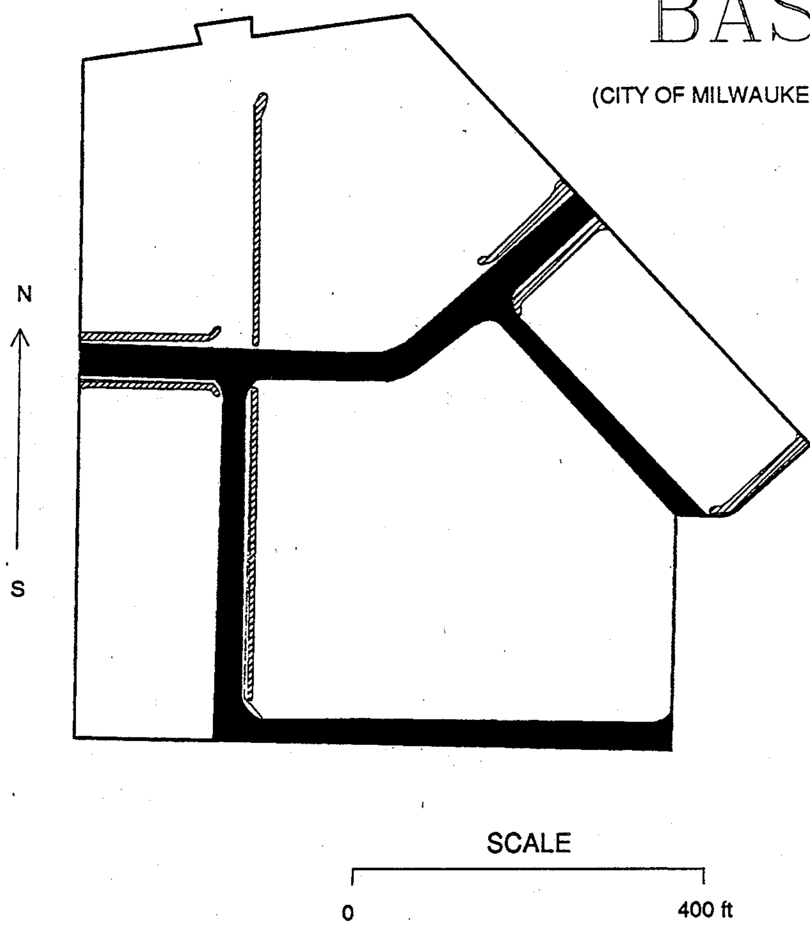
Digitized Site Area Maps

These maps were created by the U.S. Geological Survey for inclusion in this report. They are intended to qualitatively illustrate the general layout of each study area. The Monroe Street study area was not available when this report was prepared.

[mad-603-34g]

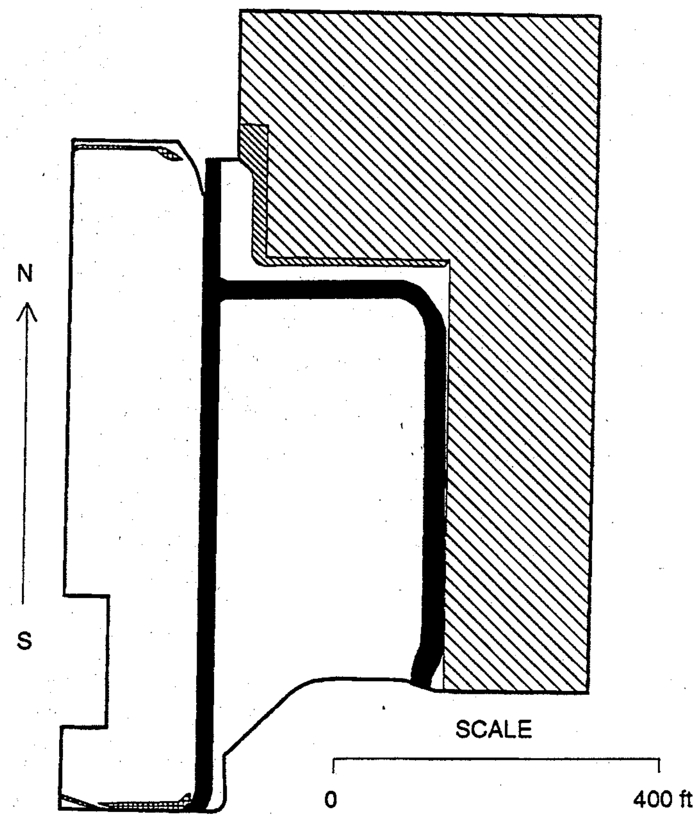
POSTOFFICE BASIN

(CITY OF MILWAUKEE)



** SITE MAP COMPILED BY U.S. GEOLOGICAL SURVEY.

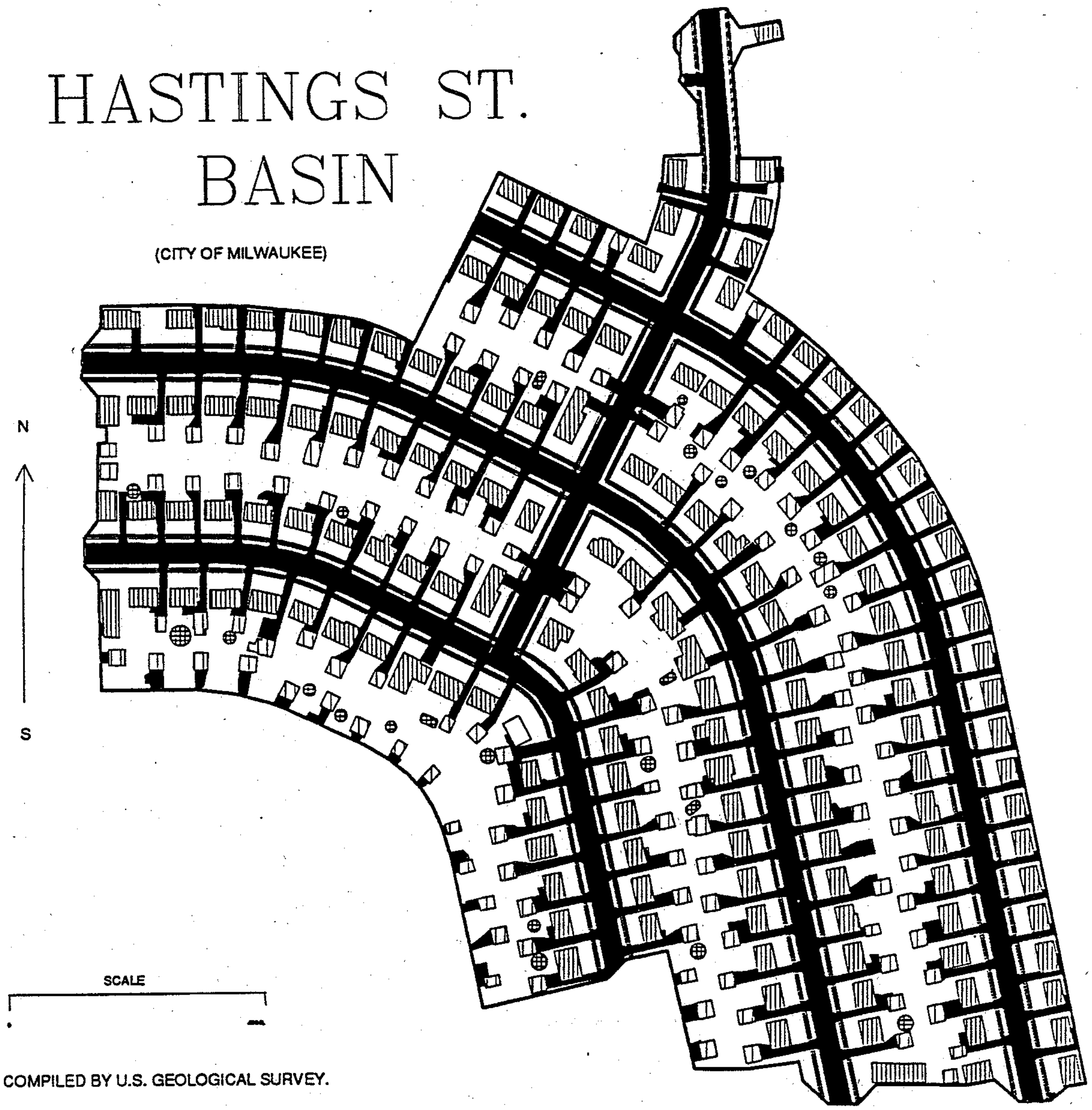
RUSTLER BASIN



** SITE MAP COMPILED BY U.S. GEOLOGICAL SURVEY.

HASTINGS ST. BASIN

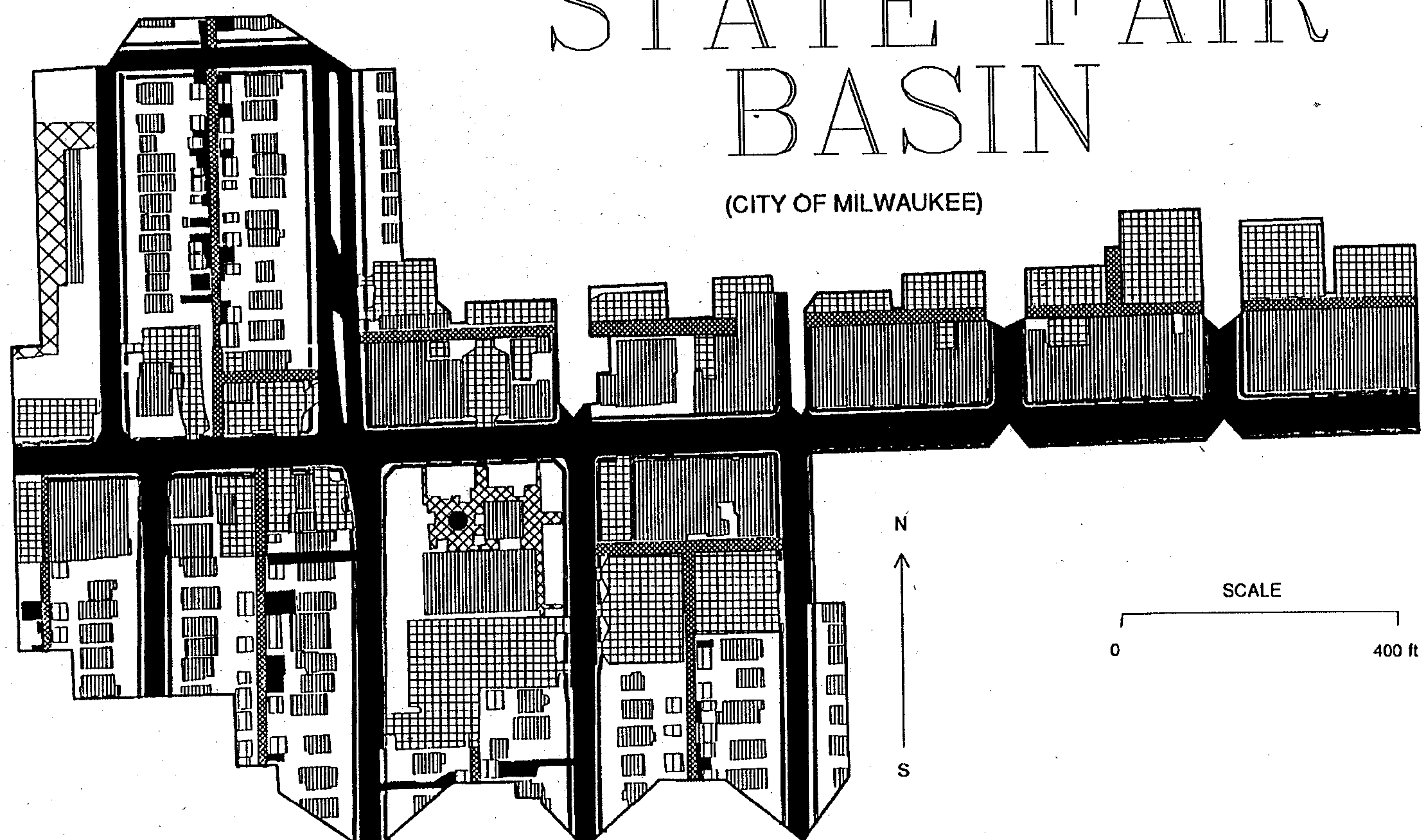
(CITY OF MILWAUKEE)



** SITE MAP COMPILED BY U.S. GEOLOGICAL SURVEY.

STATE FAIR BASIN

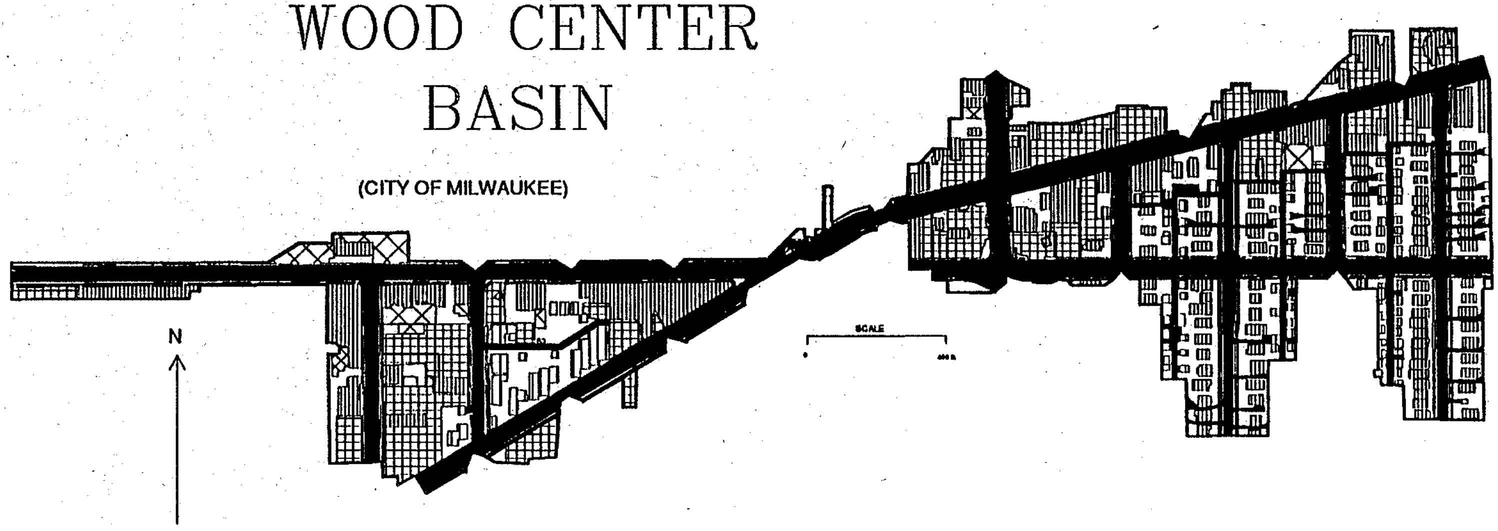
(CITY OF MILWAUKEE)



** SITE MAP COMPILED BY U.S. GEOLOGICAL SURVEY.

WOOD CENTER BASIN

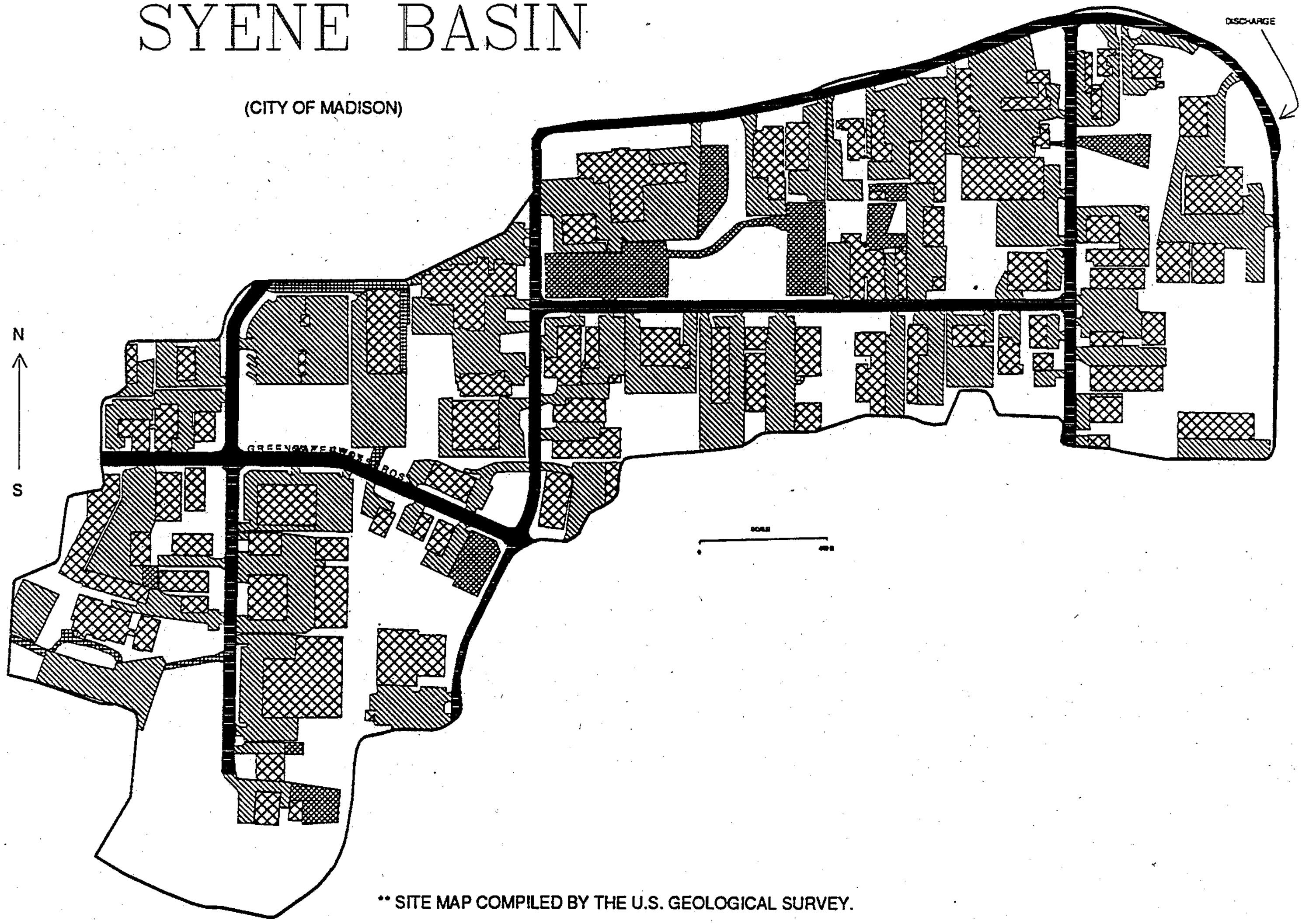
(CITY OF MILWAUKEE)



** SITE MAP COMPILED BY U.S. GEOLOGICAL SURVEY.

SYENE BASIN

(CITY OF MADISON)



** SITE MAP COMPILED BY THE U.S. GEOLOGICAL SURVEY.